VOL. LXXXII PART THREE

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

MARCH 1957

PAGE

The Secretary's Page 97

Notes from Wisley. By J. B. PATON 100

Sir William Wright Smith, F.R.S., F.R.S.E., V.M.H. By Dr. H. R. FLETCHER, V.M.H. *Illustrated* . . 103

The John Innes Institution and its Work. By J. NEWELL, N.D.H. *Illustrated* 107

The Control of the More Important Diseases and Pests of Fruit. By F. W. WEBB, N.D.H. 121

NOTES FROM FELLOWS:

Christmas Freaks? By The COUNTESS OF ROSSE . 127

Award of Garden Merit—XCII. By G. E. PETERSON . 127

Plants and Problems—XXXII 129

WISLEY TRIALS, 1956:

Canterbury Bells 130

Godetias 131

Lobelias 132

Salvia splendens 133

Plants to which Awards have been made in 1956 . . 134

Orchid 137

Book Notes 137

★

VINCENT SQUARE, LONDON, S.W.1

Ideal Gardens

No HOME is ideal without a garden. So the Daily Mail Ideal Home Exhibition has ideal gardens—real showpieces that reveal the master gardener's skill in culture and layout. They are being prepared in conjunction with the following leading firms who are exhibiting.

Allwood Bros. Limited
Jacques Amand.
Frank Cant & Co. Ltd.
Granvilles Ellis.
Messrs. Wallace & Barr.
Wells (Merstham) Limited.
Geo. G. Whitelegg.
Wheatcroft Bros. Limited.
The Kew Topiary Nurseries Ltd.

Elizabethan Gardens of Music Enjoy the tranquillity and beauty of these lovely gardens laid out in the style of the First Elizabethan Age.

FREE ADMISSION TO THE GARDENS is available up to 1 p.m. each day for Fellows of the Royal Horticultural Society and holders of Fellows' transferable tickets.

OLYMPIA
MARCH 5-30

OPEN DAILY (except Sundays) 10 a.m. — 10 p.m.
Tickets obtainable at the Entrance, or from Keith Prowse Ltd., and all agents.

CROPS OF WILTS AND MIGHT-HAVE-BEENS?

ASKS BOB GREEN

our gardening expert

Has it struck you lately that your plants aren't growing like they used to do? Hard work and little to show for it? Then it's a hundred to one there is disease in your soil, and the longer you leave it the worse it will get. No time to lose, lads—clean up the soil by sterilizing it *now*, before you plant.

With clean and healthy soil your plants and seedlings will get away to a flying start this season. All you need is a can of Jeyes' Fluid. Yes, Jeyes' the safe household disinfectant—just as effective against disease in the garden as in the house.

Simply sterilize *as you dig*. Soak the bottom of each trench with ONE tablespoon of Jeyes' per gallon of water, and as you throw in the top spit soak that too. It's cheap enough, so use plenty—at least a gallon of solution per square yard.

Leave the plot for at least a fortnight, then rake over and it's ready for sowing or planting. You'll find full details of this and many other vital jobs in "Jeyes' Fluid in the Garden".

Sterilize your potting soil too, and disinfect pots and seed boxes with Jeyes' to prevent re-infection. There's nothing like good clean soil to promote fine healthy growth.

WRITE *for free copy of new, revised edition of "Jeyes' Fluid in the Garden".*

NEW! *Gardening book "ALL GROWS WELL" by FRED LOADS, describing in detail the way to success with flowers, fruit, vegetables, greenhouses, lawns etc., etc. —4/6d post free.*

Quart cans 5/- Gallon cans 15/-.
Trial bottle 1/10d — from hardware stores, horticultural suppliers, chemists and grocers.

JEYES' FLUID

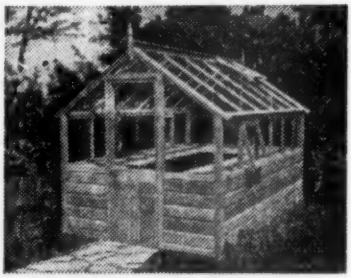
the best disinfectant on earth

JEYES' (DEPT. H.S.18) · RIVER RD · BARKING · ESSEX

C. H. WHITEHOUSE
LIMITED

'Phone: FRANT 347

Buckhurst Works, FRANT, Sussex



Size 8 ft. by 6 ft.

The "IDEAL"
ALL-CEDAR
Greenhouse

Constructed of Western Red Cedar in six complete sections. Easily removable staging to fit along both sides. May be supplied either completely glazed or with the glass supplied cut to size.

The IDEAL Greenhouse for the small garden

Painting Unnecessary • Low in Upkeep Costs

NEW FULLY ILLUSTRATED CATALOGUE FREE ON APPLICATION

First Quality

HERBACEOUS & ROCK PLANTS

READY *NOW* FOR SPRING PLANTING

Send now for our comprehensive 116-page fully illustrated General Catalogue . . . offering over 2,000 different varieties of plants to choose from. Send for your copy TODAY, enclosing 1/- in stamps, which will be credited on your first order.

SCABIOUS SIX

WONDERFUL NEW VARIETIES

THE SOUTER COLLECTION	Catalogue Value
One each of	27/6
Challenger	
Dinkie	SPECIAL OFFER
Florist's Delight	25/-
Rosalind	
Rosa Mary	
Souter's Violet	Carriage paid

TOYNBEE'S NURSERIES

BARNHAM, BOGNOR REGIS, SUSSEX

Telephone EASTERGATE 412/3

BY APPOINTMENT TO HER MAJESTY THE QUEEN
SEEDSMEN

CARTERS TESTED SEEDS

The distinction and quality of CARTERS TESTED SEEDS is recognised by all discriminating Gardeners everywhere. By scientific breeding and constant selection year after year, for more than 100 years, our strains of the finest quality vegetables and flowers of refinement have been evolved and perfected.

"Blue Book of Gardening" Catalogue

Free on Request

Carters TESTED SEEDS LTD

134 Regent Street, W.1
129 High Holborn, W.C.1
53a Queen Victoria Street, E.C.4
Houston Road, S.E.23

RAYNES PARK, LONDON, S.W.20

Are there any

POTHOLES OR WORN PLACES

in Your **PATHS,** DRIVE OR FORECOURT?

Then use MENDAROAD, the simple self-applied asphaltic material which can be **Laid Cold** with ordinary garden tools. Each bag is a complete unit providing a hard impervious surface ready for immediate use.

Single cwts. 29/6
Not less than 3 cwts. 27/6 per cwt.
Not less than 6 cwts. 25/- per cwt.

RESURFACE WITH MENDAROAD
29/6 per cwt.

Packed in ¼ cwt. bags. Carriage paid England and Wales.

MENDAROAD

DO IT YOURSELF – AT A QUARTER THE COST

GEO. A. WEBSTER LTD.
11 MERTON AVENUE, CHISWICK, W.4
Phone CHI. 4981

OAKWORTH

SEASONED OAK GREENHOUSES

5 YEAR GUARANTEE

"ZZ" Series. All 5' 2" wide, from £19.10.0.

Lean-to's. Various widths, from £20.5.6.

"D" Series. All 8' 3" wide, from £35.10.0.

★ SCIENTIFICALLY CONSTRUCTED TO GROW MORE AND LAST LONGER
★ TREMENDOUS STRENGTH ★ MAXIMUM LIGHT
★ WILL NOT WARP OR ROT ★ ALL MODELS EXTENDIBLE

Complete prefabricated units. Delivered free to your door. Erected on delivery. Deferred Terms. Full details of prices and 50 sizes available in:

FREE CATALOGUE *from*

Oakworth Greenhouses, Dept. JRH, Wellington, Salop.

THE NATION'S GREENHOUSE SPECIALISTS

FOR NEARLY 100 YEARS

the names of

WALLACE & BARR

have been associated with all that is best in gardening.

HARDY PLANTS

The 1957 edition of our catalogue is now published and contains the best up-to-date varieties of border plants, alpines, etc., including also many new and noteworthy plants.

Catalogue post free on request

LILIUM AURATUM

The hardy White Golden-rayed Crimson-spotted Lily of Japan.

Per dozen 44/-; each 4/-

Orders under 50/- add 1/6 for postage

WALLACE & BARR
THE OLD GARDENS
TUNBRIDGE WELLS, KENT

JUDGE BY RESULTS...

There is really only one test of a fertilizer and that quite obviously is the growth and quality of the plants. The remarkable popularity of SANGRAL is the result of SUCCESSFUL use by tens of thousands of gardeners and enthusiastic RECOMMENDATIONS to their friends.

Judge for yourself . . . feed some of your plants with "Sangral" but leave some without. You will see the amazing difference and superiority of the "Sangral" fed plants. The specialised and unique methods of manufacture allied to the use of the finest possible constituents make "Sangral" truly the World's Greatest Liquid Manure.

SANGRAL

TEN-DAY

FERTILISER

Pkts. 8d. Cartons 2/6, 5/–, 12/6
Bottles 2/-, 3/6. Half-gall. 13/6

SOLD EVERYWHERE

WALTER C. SLOCOCK, Ltd.

FOR OVER 160 YEARS

RHODODENDRON SPECIALISTS

AND PRODUCERS OF FIRST-QUALITY

ORNAMENTAL TREES AND SHRUBS, FRUITS, ROSES, Etc.

Please write for copies of our

CATALOGUES

"RHODOS and AZALEAS" and/or "TREES and SHRUBS"

(Post Free)

GOLDSWORTH NURSERY
WOKING ∴ SURREY

EN-TOUT-CAS

EXPERTS IN THE DESIGN AND CONSTRUCTION
OF ALL KINDS OF
HARD COURTS AND SPORTS GROUNDS

GRASS SEEDS

guaranteed

1 TRUE TO SPECIFICATION
2 GERMINATION
3 PURITY

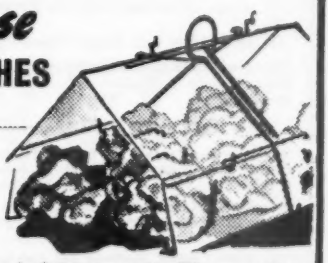
Send for Special List giving Specifications and Percentages

THE EN-TOUT-CAS CO. LTD., SYSTON, Nr. LEICESTER (Syston 86163, 4, 5, 6)

LONDON OFFICE: HARRODS (4th Floor), KNIGHTSBRIDGE, S.W.1 Tel.: Sloane 8117-8

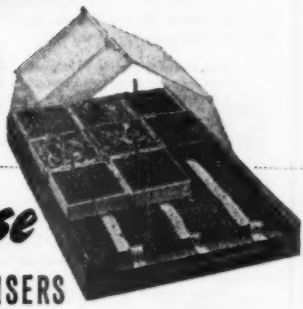
Chase Aids FOR YOUR GARDEN

Chase CLOCHES



The best cloches on earth. They protect your plants from wind and frost, ensure strong, heavy-yielding crops which mature *weeks* earlier. Chase Cloches can be used all the year round. Obtainable everywhere. *Send NOW for free booklet on Cloche Gardening.*

Prices from £1. 15. 0 to £8. 10. 0



Chase SEED-RAISERS

Chase electric or oil-heated Seed Raisers are the complete answer for gardeners who have no heated greenhouse. Inexpensive, efficient and very economical. Glass-fibre wicks ensure correct humidity. *Send for full details.*

Chase SEEDS
COMPOST GROWN

For vegetables of superb flavour, flowers of superlative colour and perfume, strong growing and disease resistant, sow Chase compost-grown seeds. Hand picked and untouched by chemical fertiliser. *List free on request.*

CHASE LIMITED, 38 (O) CLOCHE HOUSE, SHEPPERTON, MIDDLESEX

WALTER BLOM & SON
LIMITED
(of Holland)
LEAVESDEN, WATFORD,
HERTS.

GOLD MEDAL
WINNERS at
SOUTHPORT,
BIRMINGHAM,
LEAMINGTON
SPA,
READING,
Etc.

BLOM for Chrysanthemums and Dahlias

Clean healthy plants of Superior Quality with Strong Root Growth

★ PERFECT PACKING
ENSURES SAFE ARRIVAL

ROSES
FOR SPRING PLANTING

The Nosegay Collection

Twelve Hybrid Tea Roses selected for colour, reliability, and above all for fragrance:
Brazil, Chas. Mallerin, Crimson Glory, Dr. Valois, Grandmère Jenny, Hector Deane, Mme. Latieulle, Shot Silk, Signora, Souv. de Jacques Verschuren, Tally Ho, Texas.

(This list may be subject to variation)

12 first quality Roses for 52/6
6 selected from above for 27/6

Carriage and packing free for cash with order

Stewarts
NURSERIES
FERNDOWN Est. 1742 DORSET

NEW FLOWERS FOR 1957!

Here are some of the interesting Flower Seed Novelties we are offering for 1957.

190. Candytuft, Fairy Mixture. A miniature race of very dwarf and compact plants about 9 inches high. per pkt. 1s. 0d.

51. Cyclamen, Pink Fragrance. A charming rose-pink variety with sweetly-scented flowers. per pkt. of 12 seeds 2s. 6d.

643. Dahlia 'Autumn Festival'. These have double or semi-double flowers in shades of red, orange and yellow with dark copper-red foliage. per pkt. 1s. 0d.

680. African Marigold 'Crackerjack'. Compact growing and very early flowering with large double flowers of primrose, gold and orange. per pkt. 6d.

722. Petunia 'Red Satin'. An F.1 hybrid for bedding with incredibly vivid flowers of crimson-scarlet. per pkt. 2s. 6d.

743. *Phlox Drummondii*, Twinkling Stars. Clusters of star-like flowers in many brilliant hues. per pkt. 1s. 6d.

FREE. Send for your copy of our 84-page catalogue, beautifully illustrated in colour and containing particulars of many new and interesting varieties of flower and vegetable seeds at money-saving prices.

SAMUEL DOBIE & SON LIMITED
(Dept. 30) 11 GROSVENOR ST., CHESTER

BENTLEY'S
CHRYSANTHEMUM FERTILISERS
Again Pave the Way to Success

At the 1956 N.C.S. Early-Flowering Show

The Crane Challenge Cup and the Johnson Challenge Cup. Won by G. Hughes, Esq., Newton St. Loe, Bath.

At the 1956 N.C.S. Late-Flowering Show

The Centenary Trophy, The Bentley Trophy and the George Prickett Challenge Trophy. Won by J. M. Bishop, Esq., Seacroft Holiday Camp, Hemsby.

The Holmes Memorial Challenge Cup (for 18 incurved blooms) Won by G. Hughes, Esq., Newton St. Loe, Bath.

The Keith Luxford Challenge Cup and the Holmes Memorial Challenge Cup (for 12 large exhibition blooms). Won by D. Tyson, Esq., Church Farm, Hemsby.

All the above exhibits were fed exclusively WITH BENTLEY'S CHRYSANTHEMUM FERTILISERS

Complete Catalogue and Price List, Post Free on request.

JOSEPH BENTLEY LIMITED
Horticultural Manufacturing Specialists
BARROW-ON-HUMBER, LINCS.

FRAGRANT FREESIAS

IN

YOUR GARDEN

PLANT THE GENUINE

*"PARADISE" FREESIAS

RED, IVORY-WHITE, ORANGE, CREAM-YELLOW, BRONZE, BLUE

SWEET-SCENTED FLOWERS

There will be a constant flowering over a period of 8 weeks or even longer

ASK FOR THE GENUINE

"PARADISE" FREESIAS

YOUR

GUARANTEE OF SUCCESS

DO NOT ACCEPT ANY SUBSTITUTES

"PARADISE" FREESIAS AT ALL BULB MERCHANTS AND SEEDSMEN

* REGD. PRODUCT OF HOLLAND

ISSUED BY

H. DE GRAAFF & SONS, WISBECH, CAMBS.

WHOLESALE ONLY

Turn your GRASS into "VELVETONE LAWN"

ITP

VELVETONE

THE ORGANIC LAWN CONDITIONER

MAKES LAWNS LIKE VELVET

Extensively used by GREENKEEPERS for PUBLIC PARKS, SPORTS GROUNDS. USED NOW AND FOR MANY YEARS PAST ON THE ROYAL LAWNS AND ENCLOSURES AT ASCOT

I.T.P. VELVETONE is formulated on a colloidal organic base. It contains all the plant foods required for the healthy growth of finer grasses in exactly the right proportion, in a series of phases becoming available in succession. Besides the major plant foods there are various trace elements essential to the growth of hard-wearing fibre. I.T.P. VELVETONE discourages moss and fungal growth, and because of its exact composition it causes grasses to smother out and take over from weeds, thus ensuring that there are no bare patches. Regular use ensures a smooth velvety sward which retains its colour even in drought. Velvetone is most economical, only 2 oz. per square yard is required. 4 lb. bag 4/- 7 lbs. 5/6 14 lbs. 10/6 1 cwt. 40/-

FROM ALL GOOD RETAILERS

INTERNATIONAL TOXIN PRODUCTS LTD., NORTHWICH, CHESHIRE

By appointment Nurserymen to
Her Majesty Queen Elizabeth
The Queen Mother

Visit our GROUP OF ORCHIDS in the OLD HALL, Vincent Square, MARCH 19th/20th, and at CHELSEA in the Great Marquee.

You will find our exhibit quite distinct from the others. Our staff will treat you with their usual courtesy. They are willing to help you on all MATTERS ORCHIDACEOUS.

BEGINNERS' COLLECTIONS of Orchids from £5
(Ref. A5) *from*

SANDERS, Royal Orchid Nurseries, St. Albans, Herts. Phone: 53245 Ref. A

Let **HUMEX**
solve your heating problems!

Horticultural Watertight Pattern

TUBULAR HEATERS

2 ft.	120 watts	31/- carr.	2/-
3 ft.	180 „	36/- „	2/-
4 ft.	240 „	41/- „	2/6
6 ft.	360 „	51/- „	2/6
8 ft.	480 „	61/- „	3/6
10 ft.	600 „	73/6 „	3/6
12 ft.	720 „	84/6 „	4/-

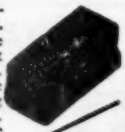
Rustless aluminium case. Complete with fixing brackets. 60 watts per foot. Can be mounted singly or in banks.

THERMOSTATS

Model B/1 (illustrated) for greenhouses. Capacity 5 amps. 35°–75° F. Price 37/6, post free

Model A/2 for greenhouses, with Pilot Light. Capacity 15 amps. 35°–75° F. Price 55/-, post free

Model P/F for birdrooms, living rooms, sheds, etc. Capacity 15 amps. 40°–80° F. Price 40/-, post free



POST THIS COUPON NOW!

Please send FREE Brochure on Automatic Greenhouse Heating.

NAME .....

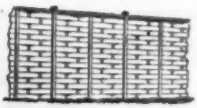
ADDRESS .....

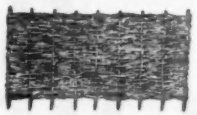
ROBERTS ELECTRICAL COMPANY LTD. (Dept. RH2)
11/13 *High Road, Byfleet, Surrey. Tel. : Byfleet* 3928

STUART BOOTHMAN

has specialised in
ROCK GARDEN PLANTS
for over twenty years.
His illustrated catalogue gives cultural notes for each sort and guarantees to replace any that die within three months of planting.
Please ask for a copy.

NIGHTINGALE NURSERY, MAIDENHEAD • BERKS.





VALE INTERWOVEN FENCING

3ft. high 19/- 5ft. high 29/-
4ft. „ 24/- 6ft. „ 34/-
Strong 6ft. long panels. Creosoted

TOP GRADE WATTLE HURDLES

2ft. high 13/11 5ft. high 23/9
4ft. „ 17/6 6ft. „ 27/9
Best closely woven 6ft. long Hazel. Carr. Paid Stn. 200 miles.

PROMPT DESPATCH

C.W.O. or EASY TERMS. Also SUPERLAP RUSTIC WEATHERBOARD, CLOSEBOARD & CHESTNUT FENCING, WILLOW HURDLES, GATES, GARDEN STONE, TUBS, LADDERS GARAGES & SHEDS

Write for free lists. Special dozen rate.
VALE COUNTRY PRODUCTS
(Dept. R.), Wantage, BERKS.

JUSTIN BROOKE LTD.

WICKHAMBROOK, Nr. NEWMARKET, SUFFOLK

We invite you to visit our nurseries and fruiting orchards at any time, including Sundays—preferably by appointment.

We have a large acreage of nursery stock, including Peaches, Nectarines, Apricots, Cherries, Apples, Pears, Plums and Figs.

In our fruiting orchards you can see the results obtained by planting similar stocks of all these fruits; and you can see the results at various stages of growth.

PEACHES ON PEACH STOCK

Telephones:
In office hours—Wickhambrook **200** Out of office hours—Wickhambrook **304**

★ SPECIAL ANNOUNCEMENT

The

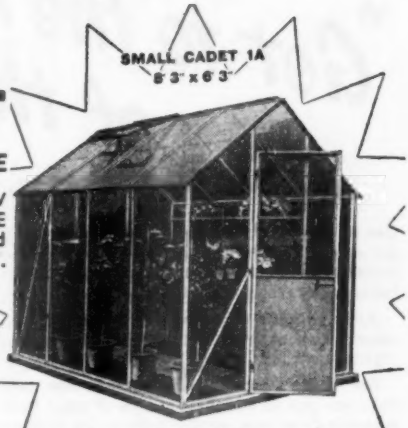
CRITTALL

'CADET' RUSTLESS GREENHOUSE

previously made in four sizes only, is NOW PRODUCED as an EXTENSIBLE GREENHOUSE in two widths, 6' 3" and 8' 3", and can be extended to ANY LENGTH in multiples of 2' 0" from 8' 3".

A few examples:—

Width	Length	Price
6' 3"	16' 6"	49 gns.
8' 3"	16' 6"	58 gns.
6' 3"	30' 10"	82 gns.
8' 3"	30' 10"	97 gns.



TO PRESENT 'CADET' OWNERS

You can now extend your Greenhouse with special units available in 4 ft., 8 ft. and 10 ft. lengths. Prices from 11 gns.

DEFERRED TERMS AVAILABLE. *FREE DELIVERY: ENGLAND and WALES*

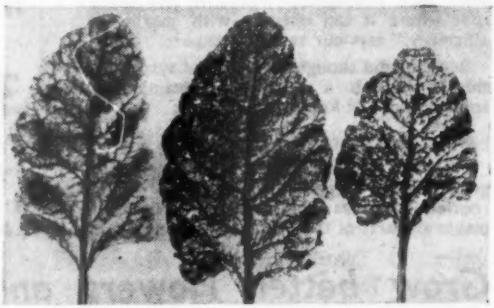
Send for full details to:

THE CRITTALL MANUFACTURING CO. LTD., Horticultural Department C, Braintree, Essex

---

manganese deficiency

Among the root crops of farm and garden which are very susceptible to manganese deficiency are sugar beet, mangels, and garden beet. In broad-leaved plants the chlorotic (yellow) patches associated with the deficiency occur commonly as spots or speckles, producing a mottled effect. In sugar beet the condition is known as 'speckled yellows'—*here illustrated.*



Leaves of affected plants tend to be unusually erect and triangular in shape, with margins curling upwards. In garden beet the chlorotic areas may be obscured by the red pigment.

Information and literature may be obtained from our Agricultural Department. If you have difficulty in purchasing manganese sulphate locally, please communicate with us.

CHEMICAL & CARBON PRODUCTS LTD.

14T NEW BURLINGTON STREET LONDON W1

Telephone REGent 1921 (five lines) Cables CHEMICARBO LONDON

"Get to the root of things"

Says Fred Streeter, V.M.H.

Get to the root of things! That's the way to get results in a garden—feed the roots of the plants. The more efficiently you do this the better the results—and it's as simple as that!

And you get directly to the roots when you place a Plantoid right alongside them—that's logical, isn't it!

But there's more to it, because not only have you put an adequate supply of plant food where it does most good—right at the roots—you have put a Plantoid which feeds the roots drop by drop just as the plant needs it.

Plants drink; they don't eat—but they drink so slowly that they can't fully benefit from large doses of liquid food which soon sink beyond the root area; the constant steady trickle from a Plantoid suits them, they get it all, none is wasted.

Now as to quantity—it's idle to suppose you can get something for nothing—if you spread plant food over a wide area everything, including weeds, gets a little—how very much more wise to feed a Plantoid to just those plants you want to grow, the plant gets the lot—the weeds get nothing.

That's why Plantoids are so amazing in their results. It's not magic, it's just plain straightforward common sense, perhaps I really should say science.

"An adequate concentration of suitable plant food strategically placed in the exact spot where it can operate with maximum efficiency," says our technical expert.

But splendid though the Plantoid system is, the Formula is a remarkable example of applied scientific knowledge.

Here's how **Plantoids** work.

Moisture first dissolves the *Nitrogen* for growth—this element tends to draw young rootlets towards the Plantoid. Nitrogen makes all parts of the plant grow quickly, but used alone it would tend to rather sappy growth and that is where the next part—*Potash*—comes in, to make this initial growth sturdy—make the plant robust and more able to resist disease.

Plants need *Phosphates* when producing flower and fruit, and we use a phosphate which is not washed away by water. It remains where you put it, surrounded by roots which exude a sap to dissolve phosphate as the plant needs it. Again nothing is wasted—the plant gets it all.

Two more elements—*Iron* and *Manganese*—bring vivid colour. All plants fed with Plantoids are remarkably brilliant, one might almost say this feature alone makes the use of them worth while. Plantoids contain *Calcium* to keep the soil sweet; *Magnesium* to help prevent disease, and *Naphthalene* to keep soil pests at bay.

That's why they're so efficient—nothing is wasted. That's why users are so loud in their praise—in all parts of the world. In Plantoids nature and science work together as never before—THAT'S WHY!

And this can all happen in your garden. Buy a 3/6 packet of Plantoids from your dealer today. You'll get results out of all proportion to the trifling cost.

Yours sincerely,

FRED STREETER

3/6

STANDARD PACK

also in

2/- & 8/-

PACKS

Grow better Flowers and Vegetables with

PLANTOIDS

PLANT GROWTH TABLETS

REGD.

Made by PLANTOIDS LTD., Bromley, Kent. **ONE OF THE GRAHAM FARISH GROUP**

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXII PART THREE

March 1957

THE SECRETARY'S PAGE

ANNOUNCEMENTS—MARCH AND APRIL

Shows—The Society's Fortnightly Shows are held in the Society's New Hall in Greycoat Street and/or the Old Hall in Vincent Square, Westminster.

TUESDAY, March 5 12 NOON to 6 P.M. WEDNESDAY, March 6 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall.
TUESDAY, March 19 12 NOON to 6 P.M. WEDNESDAY, March 20 10 A.M. to 5 P.M.	Fortnightly Flower Show and Alpine Garden Society's Competition, in the New Hall. British Orchid Growers' Association's Show, in the Old Hall.
TUESDAY, April 2 12 NOON to 6 P.M. WEDNESDAY, April 3 10 A.M. to 5 P.M.	Fortnightly Flower Show and Daffodil Competition, in the New Hall. Alpine Garden Society's Show, in the Old Hall.
TUESDAY, April 16 12.30 P.M. to 6 P.M. WEDNESDAY, April 17 10 A.M. to 5 P.M.	Fortnightly Flower Show, Camellia Competition and Sewell Medal Alpine-House and Rock-garden Plant Competition for Amateurs, in the New Hall. Daffodil Show, in the Old Hall.

Shows—*continued.*

TUESDAY, April 30 12.30 P.M. to 6 P.M.	Fortnightly Flower Show and National Rose Society's Competition, in the Old Hall.
WEDNESDAY, May 1 10 A.M. to 5 P.M.	Rhododendron Show, in the New Hall.
	National Auricula and Primula Society's Competition (May 1 only), in a Committee Room in the New Hall.

Lectures

TUESDAY, March 5, at 3 P.M. "The Rock and Peat Gardens at the Royal Botanic Garden, Edinburgh", by DR. H. R. FLETCHER, F.R.S.E., V.M.H.

TUESDAY, March 19, at 3 P.M. "Some Impressions of the Western States of the U.S.A.", by MR. E. H. M. COX.

TUESDAY, April 2, at 3 P.M. "A Week-end Garden", by DR. R. BEVAN, F.L.S.

TUESDAY, April 16, at 3 P.M. Symposium on Garden Design in relation to Reduction of Labour and Maintenance Costs, by MR. R. SUDELL, F.I.L.A., MISS B. COLVIN, F.I.L.A., MR. P. CANE, and MR. L. MILNER WHITE, F.I.L.A.

TUESDAY, April 30, at 3 P.M. "Hellebores", by MR. E. B. ANDERSON, M.SC.

Camellia Competition—The annual Camellia Competition will be held in conjunction with the Fortnightly Show on April 16 and 17. The Schedule, which may be obtained on application to the Secretary, is similar to that for last year's Competition, but attention is drawn to the following changes:

The system of classification for varieties of *Camellia japonica* has been revised and a classified list of varieties is given.

Provision has been made for the exhibition of margined as well as blotched and striped varieties in certain classes.

A new class has been provided for *C.* × 'Salutation'.

Rhododendron Show—The annual Rhododendron Show will be held in conjunction with the Fortnightly Show on April 30 and May 1. The Schedule, which may be obtained on application to the Secretary, is similar to that for last year's Show but contains a new class for a hybrid of any of the Thomsonii Sub-Series other than *thomsonii*.

Rhododendron Handbook, 1956—Part I dealing with Rhododendron Species has now been published and is available on application to the Secretary, The Royal Horticultural Society, price 12*s.* 6*d.*, postage and packing 1*s.* This part of the Handbook has been extensively revised and some keys to the species within particular series have been inserted.

Lily Group Meeting—The Lily Group will hold its first meeting of the year in the Lecture Room of the New Hall at 4.30 P.M. on Tuesday, April 30, when there will be a discussion on "Lilies for a Small Garden".

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being in each case a repetition of that given on the first.

MARCH 6–7. Seed Sowing and Vegetative Propagation of Alpines. (Commencing at 2 P.M.)

MARCH 13–14. Pests and Diseases of Fruit Trees: Recognition and Methods of Control. (Commencing at 2 P.M.)

The Restaurant at Wisley—The Restaurant in the Gardens will be open at the following times during 1957:

March 27 to October 13 (excluding Good Friday)

Weekdays: 10.30 A.M. to 6 P.M. (or sunset, whichever is the earlier).
Sundays: 2 P.M. to 5.30 P.M. (to last Sunday in September).
2 P.M. to 4.30 P.M. (Sundays, October 6 and 13).

The restaurant will provide a cafeteria service of cold lunches, sandwiches, cakes, tea, coffee and other light refreshments. There will also be a waitress service for hot lunches. The restaurant is licensed for the service of alcoholic refreshments with meals. Reservations for lunches and teas by large parties may only be made for Mondays (excluding Bank Holidays) to Fridays. Organizers should make arrangements, not with the Society, but direct with the caterer, MRS. D. BADCOCK, XVth Century Tea Rooms, Shere, nr. Guildford, Surrey (*Tel.* Shere 168).

Picnicking is not allowed in the Gardens.

Floral Arrangement Judges, Demonstrators and Lecturers—The Floral Arrangement Committee has compiled a list of ladies and gentlemen who are willing to act as judges of floral arrangements or to give demonstrations or lectures on the subject. The Secretary will be pleased to post a copy to anyone who sends a stamped addressed envelope.

Gardens at Daily Mail Ideal Home Exhibition—This annual Exhibition will be held at Olympia in 1957 from March 5 to March 30. As usual the gardens laid out in the Annexe of the Grand Hall will be one of the most attractive features of the Exhibition. Fellows' and Associates' tickets will give free admission to the Gardens Annexe (but not to the rest of the exhibition) any day from 10 A.M. to 1 P.M.

Gardens Open to the Public—The List of Gardens in England and Wales opening to the public under the National Gardens Scheme in 1957 may be obtained from the Organizing Secretary, National Gardens Scheme, 57 Lower Belgrave Street, London, S.W.1, price 1*s.* 6*d.*; by post 1*s.* 10*d.*

NOTES FROM WISLEY

J. B. Paton

WITH the arrival of March we may expect to see more visitors to the Gardens and they will no doubt be interested to note some of the alterations which have been carried out during the winter. On Battleston Hill part of the hedge of *Rhododendron luteum*, which borders the broad grass walk, has been removed and its place will be taken by a woodland border planted with herbaceous and other plants. The removal of the hedge will allow a fine view of the Kurume azaleas to the west and to the east a better view will be obtained of the trial of hardy hybrid rhododendrons. In the woodland garden on the far side of the public footpath a considerable amount of thinning has been undertaken to allow the plants to develop fully.

A portion of the field between Battleston Hill and the Fruit Collection has been in the hands of a contractor since November. On this site there are being erected buildings to house vehicles, machinery, carpenter's shop, lavatories, etc. Further frames have been built for the Rock Garden propagating department, to shelter from the winter rains a large number of alpine plants. In the Wild Garden two areas have been cleared of overgrown rhododendrons and hollies and in replanting use has been made of the late-flowering rhododendrons removed from overcrowded positions on Battleston Hill. In addition some large specimens of camellias have been transplanted from other parts of the Wild Garden.

In Seven Acres some drastic pruning of the shrubs has taken place. The fine specimen, near the lake, of *Pyrus salicifolia* var. *pendula* has been brought into more prominent view by the removal of some barberries and the plant has now been surrounded by grass. A certain amount of dead wood has been removed and it has been shaped by lightly pruning. The site to accommodate the Nisbet collection of dwarf conifers is still, in mid January, in process of preparation.

Throughout March one of the most interesting features in Seven Acres are the plants of the various willows and forsythias. The name of the genus *Forsythia* commemorates WILLIAM FORSYTH, one time Superintendent of the Royal Gardens at Kensington and one of the founder members of the Society.

The first forsythia to attract attention is *F. giraldiana* which opens its soft yellow flowers in early March and makes a charming contrast to the orange-bronze stems of *Salix alba* var. *chermisina* also known as *S. vitellina* var. *britzensis*. The next forsythia to open its blooms is *suspensa* which forms a rather straggly bush of pendulous and often crossing branches when grown in the open. It is really more suited to cultivation against a wall. There are two varieties of this species to be seen in Seven Acres—*atrocaulis* and *decipiens*. The former, discovered

by WILSON in Western Hupeh in 1907, has the young shoots tinged with a dark purplish hue, while the latter originated in Spath's Nursery near Berlin and has deeper yellow flowers on long flower stalks. The Korean *F. ovata* has bright yellow small flowers borne rather sparsely on a plant which does not usually assume great proportions. At Wisley there is a lemon yellow form of this species. In early April *F. intermedia* var. *spectabilis* is one of the outstanding plants in the Award of Garden Merit Collection. There are two new cultivars from the Arnold Arboretum grown under the names 'Arnold Giant' and 'Arnold Dwarf' which were received as young plants some six or seven years ago and now have reached proportions where it will be possible to assess their merits. The plants have been growing near the Award of Garden Merit Collection but now are to be found in the new mixed shrub and herbaceous borders which flank the main grass walk leading to Battleston Hill. These borders to be planted this spring will take the place of the herbaceous borders and the trial of chrysanthemums which have been in this position for the past two years.

Around the lake in Seven Acres there is to be found a variety of *Salix* which are of interest both on account of their coloured barks and the catkins which they produce in this month. The Japanese *gracilistyla* has grey, red-anthered, catkins up to 1½ inches long and the young shoots are covered with a grey down. Another eastern one is the Pekin willow, *matsudana*, which makes a graceful weeping-tree and is closely allied to the more popular *babylonica*. Its peculiar and fascinating variety, *tortuosa*, is to be seen near the Round Pond at the bottom of the Award of Garden Merit Collection. It has an erect habit with each twig contorted and twisted.

One of the most notable trees in the Gardens is *Salix alba* var. *tristis* whose pendulous bright yellow branches droop most gracefully over the lake. Its most attractive season is during March when from day to day its colour varies as the buds gradually unfold to reveal the greenish-yellow leaves. The silver form of *repens* known as *argentea* is grown here as a half-standard with the idea of producing a small tree of weeping habit. Grown in this method it is unlikely to be very long lived. This is a native willow as is *purpurea* which has thin purplish shoots. The leaves are of note throughout the summer, being a dark glossy green above and glaucous blue underneath. This willow is much used in basket-work as its twigs are both supple and tough. Osier-growers have special selections which they grow under such names as 'Red-bud', 'Dicks' and 'Welch'. The bark contains up to 7 per cent of salicin which has been used medicinally for increasing the flow of saliva, for improving the appetite and for the treatment of rheumatism. *S. daphnoides* hails from continental Europe and has only become naturalized in Britain in a few places. It has striking glossy purple shoots which are covered with a grey down in the young stages. The goat willow, *caprea*, can be seen in a fastigiate form and is the willow most frequently used for decorating churches on Palm Sunday.

Three varieties new to cultivation in this country were received from Holland in the winter of 1954. They are forms of *glandulosa* and go under the names of 'Kinme', 'Kurome' and 'Setsuka'. They may be seen in the borders around the lake and it should be possible in the next year or two to assess their merits.

PLANTS OF INTEREST AT WISLEY DURING MARCH

GLASSHOUSES

Abutilon × *milleri*
Anthurium scherzerianum
Aphelandra pectinata
Chorizema ilicifolium
Chrysanthemum foeniculaceum
Epidendrum ciliare
Grevillea rosmarinifolia
Jasminum primulinum
Lycaste lasioglossa
Mitriostigma axillare
Streptocarpus caulescens

ROCK GARDEN AND ALPINE HOUSE

Colchicum doerfleri
Crocus in variety
Cyclamen coum
» *orbiculatum*
Draba aizoon
Fritillaria pudica
Narcissus species and varieties
Primula species
Ranunculus calandrinioides
Rhododendron leucaspis
Romulea bulbocodium

WILD GARDEN

Chionodoxa sardensis
Daphne mezereum
Erythronium dens-canis
Galanthus species and varieties
Narcissus cyclamineus

WILD GARDEN—*cont.*

Pieris species
Shortia uniflora
Viburnum grandiflorum

SEVEN ACRES

Erica species and varieties
Forsythia species and varieties
Prunus sargentii
Salix species

BATTLESTON HILL

Camellia cuspidata
» *japonica* varieties
» *saluenensis*
» × *williamsii* varieties
Cornus mas
Erica species and varieties
Magnolia kobus
» *stellata*
Pieris japonica
Prunus varieties
Rhododendron species and varieties

AWARD OF GARDEN MERIT COLLECTION

Daphne mezereum
Magnolia × *soulangiana*
Osmanthus delavayi
Prunus cerasifera var. *atropurpurea*

SIR WILLIAM WRIGHT SMITH, F.R.S., F.R.S.E., V.M.H.

Dr. H. R. Fletcher, V.M.H.

THE distinguished botanical and horticultural career of SIR WILLIAM WRIGHT SMITH, Queen's Botanist in Scotland, Regius Keeper of the Royal Botanic Garden, Edinburgh, and Regius Professor of Botany in the University of Edinburgh, covered more than half a century.

Born at Lochmaben on February 2, 1875, he received his early education at Dumfries Academy and entered the University of Edinburgh as First Bursar, at the age of sixteen. Here he pursued the Arts curriculum and at the same time attended the Diploma Course for Teachers at Moray House Training College; when he graduated in 1896 he was a qualified teacher. At this time he was determined to enter the teaching profession and did, in fact, obtain a post as a teacher of secondary subjects under the Edinburgh School Board. Such free time as he had he devoted to scientific studies, especially to Botany and Zoology, and his keenness brought him to the notice of PROFESSOR SIR ISAAC BAYLEY BALFOUR, who, in 1902, persuaded him to leave the schoolroom to join his staff in the Botany Department of the University of Edinburgh. Thus began a long academic career, which, with a break of four years in India, was spent entirely in this Department.

In the early years of the century the academic staff of the University Botany Department was small and SMITH'S teaching perforce ranged almost over the entire Plant Kingdom. He was a good instructor who loved to instruct, and although in later years he published many research papers, almost entirely in the realm of taxonomy, yet it is true to say that he was first and foremost a teacher. Not only did he train a large number of botanists, some of whom have attained great eminence in their profession, but in each student he took a personal and friendly interest no matter whether or not they were to continue in the Honours Course. He was always the most approachable of men as all those who came to the Botanic Garden to visit him and were interested in plants quickly discovered. The more interested his visitors were, the happier he was to receive them and the greater was the encouragement he gave them. "My visits to the Garden at Edinburgh were always red-letter days and the little that I have learned I learned there", a most distinguished horticulturist recently wrote.

In 1907 SMITH was appointed to the charge of the Government Herbarium in the Royal Botanic Garden, Calcutta, and remained in India for four years. Twice during this period he was Acting Superintendent of the Calcutta Garden. This invaluable experience gave him first-hand acquaintance with the administration of a large scientific Garden and associated with it the care and direction of other Gardens and botanical enterprises of the Government of India—the Lloyd

Three varieties new to cultivation in this country were received from Holland in the winter of 1954. They are forms of *glandulosa* and go under the names of 'Kinme', 'Kurome' and 'Setsuka'. They may be seen in the borders around the lake and it should be possible in the next year or two to assess their merits.

PLANTS OF INTEREST AT WISLEY DURING MARCH

GLASSHOUSES

Abutilon × *milleri*
Anthurium scherzerianum
Aphelandra pectinata
Chorizema ilicifolium
Chrysanthemum foeniculaceum
Epidendrum ciliare
Grevillea rosmarinifolia
Jasminum primulinum
Lycaste lasioglossa
Mitriostigma axillare
Streptocarpus caulescens

ROCK GARDEN AND ALPINE HOUSE

Colchicum doerfleri
Crocus in variety
Cyclamen coum
» *orbiculatum*
Draba aizoon
Fritillaria pudica
Narcissus species and varieties
Primula species
Ranunculus calandrinioides
Rhododendron leucaspis
Romulea bulbocodium

WILD GARDEN

Chionodoxa sardensis
Daphne mezereum
Erythronium dens-canis
Galanthus species and varieties
Narcissus cyclamineus

WILD GARDEN—*cont.*

Pieris species
Shortia uniflora
Viburnum grandiflorum

SEVEN ACRES

Erica species and varieties
Forsythia species and varieties
Prunus sargentii
Salix species

BATTLESTON HILL

Camellia cuspidata
» *japonica* varieties
» *saluenensis*
» × *williamsii* varieties
Cornus mas
Erica species and varieties
Magnolia kobus
» *stellata*
Pieris japonica
Prunus varieties
Rhododendron species and varieties

AWARD OF GARDEN MERIT COLLECTION

Daphne mezereum
Magnolia × *soulangiana*
Osmanthus delavayi
Prunus cerasifera var. *atropurpurea*

SIR WILLIAM WRIGHT SMITH, F.R.S., F.R.S.E., V.M.H.

Dr. H. R. Fletcher, V.M.H.

THE distinguished botanical and horticultural career of SIR WILLIAM WRIGHT SMITH, Queen's Botanist in Scotland, Regius Keeper of the Royal Botanic Garden, Edinburgh, and Regius Professor of Botany in the University of Edinburgh, covered more than half a century.

Born at Lochmaben on February 2, 1875, he received his early education at Dumfries Academy and entered the University of Edinburgh as First Bursar, at the age of sixteen. Here he pursued the Arts curriculum and at the same time attended the Diploma Course for Teachers at Moray House Training College; when he graduated in 1896 he was a qualified teacher. At this time he was determined to enter the teaching profession and did, in fact, obtain a post as a teacher of secondary subjects under the Edinburgh School Board. Such free time as he had he devoted to scientific studies, especially to Botany and Zoology, and his keenness brought him to the notice of PROFESSOR SIR ISAAC BAYLEY BALFOUR, who, in 1902, persuaded him to leave the schoolroom to join his staff in the Botany Department of the University of Edinburgh. Thus began a long academic career, which, with a break of four years in India, was spent entirely in this Department.

In the early years of the century the academic staff of the University Botany Department was small and SMITH's teaching perforce ranged almost over the entire Plant Kingdom. He was a good instructor who loved to instruct, and although in later years he published many research papers, almost entirely in the realm of taxonomy, yet it is true to say that he was first and foremost a teacher. Not only did he train a large number of botanists, some of whom have attained great eminence in their profession, but in each student he took a personal and friendly interest no matter whether or not they were to continue in the Honours Course. He was always the most approachable of men as all those who came to the Botanic Garden to visit him and were interested in plants quickly discovered. The more interested his visitors were, the happier he was to receive them and the greater was the encouragement he gave them. "My visits to the Garden at Edinburgh were always red-letter days and the little that I have learned I learned there", a most distinguished horticulturist recently wrote.

In 1907 SMITH was appointed to the charge of the Government Herbarium in the Royal Botanic Garden, Calcutta, and remained in India for four years. Twice during this period he was Acting Superintendent of the Calcutta Garden. This invaluable experience gave him first-hand acquaintance with the administration of a large scientific Garden and associated with it the care and direction of other Gardens and botanical enterprises of the Government of India—the Lloyd

Botanic Garden at Darjeeling, the Sikkim Cinchona Plantations and the quinine factory at Mungpoo. Possibly of even greater importance was the opportunity he took of undertaking botanical exploration into little known regions of the Himalaya, especially in Sikkim, and on the borders of Nepal, Tibet and Bhutan. In 1909 he botanized the hitherto untraversed alpine regions of Llonakh on the Tibetan frontier, north of the Kanchenjunga glaciers, at altitudes of over 14,000 feet, whilst in 1910 he penetrated the high alpine regions between the Tibetan valley of Chumbi and Eastern Sikkim. These journeys are reported in the *Records* of the Botanical Survey of India. They enabled him to collect much material for future systematic study and to gain an intimate knowledge of the country and of the people. He was aware, when he was in camp at Chumbi in 1910, that his great friend GEORGE FORREST was even then encamped on the Likiang Range in Yunnan; but he did not realize in what manner this circumstance was to shape his future activities.

There is little doubt that in the comparative short space of four years he made a great and lasting impression on his Indian colleagues and until the end of his life young Indian botanists came to Edinburgh to study under him. All were treated with great kindness—and subjected to very severe discipline; and all were abundantly grateful. Neither is there any doubt but that the experience of these four years had splendidly equipped him to fill the post BAYLEY BALFOUR offered him in 1911, the Deputy Keepership of the Royal Botanic Garden, Edinburgh.

He arrived in Edinburgh as the collections of FORREST'S second expedition to Western China were being unpacked. Both BALFOUR and he, to some extent, were aware of the richness of the flora of the provinces of Western China. The collections of AUGUSTINE HENRY from the Western areas, and of the French missionaries DAVID, SOULIÉ and DELAVAY, and later of E. H. WILSON, from Szechuan and Yunnan, offered abundant evidence of this. But most of the evidence was dried material in various herbaria. FORREST, on the other hand, was not only sending home some of the most beautiful herbarium specimens ever collected, but pounds of seeds as well. "Primulas in profusion, seeds of some of them as much as 3–5 lbs." The Keeper and his Deputy realized that such material would not only enrich the collection of living plants in the Botanic Garden, but would greatly change the form of gardening in Britain. From seeds of FORREST'S first expedition, *Primula malacoides* had quickly established itself as a greenhouse plant in the short period of three years; *P. secundiflora*, *P. polyneura*, *P. serratifolia*, *P. pinnatifida*, *P. bella*, *P. forrestii* and *P. sinolisteri* had already flowered in Edinburgh and elsewhere; in 1911 *Gentiana sino-ornata* was showing its first flower buds; and there were hundreds and hundreds of young plants of *Rhododendron*, *Cotoneaster*, *Gaultheria*, *Magnolia*, *Pyracantha* and many other genera ready for distribution over the country. Quite obviously *Aucuba*, *Ligustrum*, holly and yew would give place to *Rhododendron*, *Primula*, *Gentiana* and *Meconopsis*.

Thus the two men devoted themselves to the systematic analysis of FORREST'S wonderful collections (FORREST was to make five more expeditions to Western China before he died there in 1932), BALFOUR concentrating mainly on the two great genera *Rhododendron* and *Primula*, SMITH endeavouring to encompass the rest. Between the years 1912–21 descriptions of over 550 species new to science flowed from his pen and were published in *Notes Roy. Bot. Gard. Edin.*—new species of *Saxifraga*, *Androsace*, *Delphinium*, *Gentiana*, *Codonopsis*, *Senecio*, *Aster*, *Corydalis*, *Salvia*, *Cremanthodium*, *Astragalus*, *Daphne*, *Potentilla*, *Vaccinium*, *Magnolia*, *Abelia*, *Berberis*, *Jasminum*, *Spiraea*, *Lonicera*, *Cotoneaster*, *Euonymus* and others; many of these new species have proved to be excellent garden plants. But probably the most important publication (in the *Transactions* of the Botanical Society of Edinburgh) during this period was a most valuable account of the lilies of China.

When he succeeded BALFOUR in 1922 to the dual post of Regius Keeper of the Botanic Garden and Professor of Botany in the University of Edinburgh, he continued to devote his energies to the elucidation of the collections of FORREST, and of others, from China and the Himalayas. But he did not cast his net so wide as before. Instead he immersed himself in the study of *Rhododendron* and *Primula*—particularly the latter—and jointly with FORREST he presented a revision of the sections of the genus *Primula* to the Primula Conference held by the Royal Horticultural Society in 1928. This important paper was the foundation of a much more detailed examination of the genus, the results of which were published in a long series of papers in the *Transactions* of the Royal Society of Edinburgh, and in the *Transactions* of the Botanical Society of Edinburgh. Primulas had always interested him and during his travels in the Himalaya he had been fascinated by them. But not so with rhododendrons. "I did not devote any time to them", he wrote in the *Records* of the Botanical Survey of India, and it was only BAYLEY BALFOUR'S infectious enthusiasm which induced SMITH to take up the threads from his chief. Though he did not contribute greatly to the literature of the genus, yet he was the driving force behind those Edinburgh colleagues of his who were working on these plants and in large measure too he was the stimulus behind *The Species of Rhododendron*, published by his friends of the Rhododendron Society.

His association with the Rhododendron Society was a source of the greatest joy and stimulus to SIR WILLIAM, for it brought him in close touch with many of the greatest gardeners of the day and in later years such names as F. R. S. BALFOUR (of Dawyck), COL. STEPHENSON-CLARKE, MAJOR DORRIEN-SMITH, LORD HEADFORT, SIR GEORGE HOLFORD, G. H. JOHNSTONE, SIR EDMUND LODER, LORD ABERCONWAY, L. DF ROTHSCHILD, K. MCDOUALL, SIR HERBERT MAXWELL, SIR JOHN STIRLING-MAXWELL, LORD STAIR, J. C. WILLIAMS, SIR JOHN RAMSDEN, SIR FREDERICK MOORE, were often mentioned, a little wistfully, in his conversation. These men may have learned from him; he certainly was taught much by

them. "Man! it was a humbling experience to hear them discuss Rhododendrons."

SMITH'S work added greatly to our knowledge of the flora of Asia. It also gained for the University Botany Department a reputation for taxonomic research, and the Botanic Garden became justly famous for the successful propagation and cultivation of plants, especially those from the East. Naturally his great contributions to botany and horticulture were widely recognized; knighthood in 1932; Fellowship of the Royal Society in 1945; the MacDougall-Brisbane Prize from the Royal Society of Edinburgh, of which he was President from 1944–49; the Victoria Medal of Honour in 1925 and the Veitch Memorial Medal in 1930, both from this Society of which, for many years, he was a Vice-President and its Honorary Professor of Botany and to which in 1930 he delivered the Masters Lectures. He was also an Honorary Member of the American Academy of Arts and Sciences; D. ès Sc. of the University of Toulouse, and LL.D. of the University of Aberdeen.

SIR WILLIAM was born in the country and all his life remained a man of the country, detesting cities and crowds. He had loved his days on the high hills of the Himalaya and for long afterwards nothing gave him greater joy than to carry his gun on a long moorland walk, or to climb the Scottish mountains in search of plants. In fact, a day's shooting or an alpine excursion or a visit to a friend's garden in the country or a game of tennis (he played a strong game when well over sixty, though he poached horribly at the net) was the only respite from work he took for many years. When the time came for him to forgo these pleasures and he was left only with the cricket test-match wireless commentaries to enjoy, he was much troubled. "My step was once so light on the heather—now I puff and blow if I climb the hill from the Laboratory to my house." But during his later years, that which concerned him—even grieved him—most was the death of an old friend, and his first task of the day on entering his office every morning (Sundays excepted) punctually at 8.15, was anxiously to scan the death notices in his newspaper. Often there ran in his thoughts these words from one of Horace Walpole's letters to Horace Mann: "When one preserves one's senses and faculties and suffers no pain, old age would be no grievance, but for one—and oh! that is a terrible calamity—surviving one's friends."

He died on December 15, 1956, and LADY SMITH and three daughters survive him.

THE JOHN INNES INSTITUTION AND ITS WORK

J. Newell, N.D.H.

(*Lecture given on January* 22, 1957
PROF. R. M. STOUGHTON, D.SC., V.M.H., *in the Chair*)

THE John Innes Horticultural Institution is one of our younger research stations. It was founded from a bequest of JOHN INNES, a business man whose interests were mainly concerned with property in the City of London. The scheme of the Charity Commissioners under which the Institution is governed is dated January 12, 1909.

We are often asked, who was JOHN INNES? He came from an ancient Scottish family of considerable rank. JOHN INNES' grandfather settled in London early in the eighteenth century and his son married a daughter of the founder of Reid's Brewery; he is said to have lost a considerable part of his fortune through his interest in the emancipation of slaves.

JOHN INNES was one of a family of seven children. He worked from an early age in the wharves in the City of London, and later joined an elder brother in a wine merchant's business. This was given up in course of time, when the brothers commenced dealing in lands and property in the City and on the outskirts of London. JOHN INNES' long connection with Merton commenced through one of these purchases, and eventually he settled in the Manor House at Merton, and devoted much of his time to farming on a considerable scale and to developing the estate.

Clearly he was a man of considerable foresight. He planted many of the roads on his estate between Wimbledon and Merton with trees, and some fine plantings of *Ulmus wheatleyi*, silver birch, poplars, etc., bear testimony to his interest in the beginnings of town planning. The Manor House at Merton and the adjacent farm eventually became the first home of the Institution (Figs. 31 and 32).

JOHN INNES died in 1904 and left his fortune and estate for "the study of the growth of trees and for the improvement of horticulture by experiment and research". No one knows quite why he did this. There is little evidence in his private garden—now the John Innes Park and still much as he left it—of his interest in horticulture. The wide terms of reference in his will clearly had to be limited in practice.

The early work of the Institution was largely determined by its first Director, WILLIAM BATESON, who was the pioneer in this country of the science of genetics. In the early days of Mendelism—as it was then called—when its followers were few and critics many, BATESON's house at Cambridge had become the predominant centre of its study and in his private garden many early Mendelian experiments were made. For his work a Chair of Biology was created for PROFESSOR BATESON in 1908,

at Cambridge, but a year later he accepted the directorship of the newly formed John Innes Horticultural Institution where, as he put it at the time, "untroubled by the necessity to make potatoes bigger or bread more cheap" he could set out to unravel the laws of hybridity and variation. From his enquiries and experiments, the work of the Institution has grown.

The early work of the Institution concerned the study of variegation, plant chimaeras and other apparent variations of behaviour which differed in some way from the then accepted laws of Mendelism.

Then followed the closer study of chromosomes which were to explain the mechanical aspects of how heredity works and how it fails to work when mutations or sports as we know them occur. From this it appeared only a short distance to interpret first how new species arise in nature and secondly what brings about new varieties in cultivation. Indeed the possibility of producing new species was not overlooked. The importance of chromosome studies increased as time went on and often provided the precise information to guide the plant breeder and, indeed, the gardener. One classical instance followed early efforts to confirm the principles of Mendel's law in fruit breeding, which led to the discovery of incompatibility in a number of our cultivated fruits and a generation later enabled the John Innes Institution to produce an accurate guide to the planting of orchard fruits.

On the death of PROFESSOR BATESON, SIR DANIEL HALL became Director, and during his tenure considerable expansion and widening of the scope of the work at John Innes took place. Summer courses were first held for university students. He realized, perhaps more than any one at the time, the necessity for bringing together the fundamental research worker and the practical grower. To SIR DANIEL, fundamental research, theory and practice were complementary to one another and the application of science to practice and the introduction of the practical man's experience to the research laboratory became a two-way traffic. "There should be no sharply defined line between them", and investigations, both scientific and practical, were fostered and encouraged.

At the time of SIR DANIEL'S retirement in 1939, the Institution had outgrown its twenty or so acres of land at Merton and under its new Director, DR. C. D. DARLINGTON, a larger and more suitable site was sought and, after many disappointments, found at Bayfordbury, Hertford, the present home of the Institution (Fig. 33). The mansion at Bayfordbury has now been converted into laboratories, offices and libraries, etc.; controlled temperature rooms have been constructed, glasshouses built and the gardens and new fruit orchards have been planted.

The present work of the Institution is still concerned mainly with genetics, cytology and plant breeding. A department of plant physiology has more recently been added and is investigating, amongst other things, many aspects of plant growth and development under controlled

conditions of environment, and is carrying out detailed experiments which have a close relationship, and will be of great practical value to the gardener, since they concern the factors which govern the growth of his plants.

The Royal Horticultural Society has long recognized the great importance of genetics and cytology to horticulture. Indeed, four of the last six of the Masters Memorial Lectures—the most important lectures of the year—have been devoted to these sciences (1, 2, 3, 4). Since three of these lectures have been given by members of the John Innes staff—if I might include SIR FREDERICK STERN as a member—much of the work of the Institution in these fields has already been discussed in detail and published in the JOURNAL of the Society. I shall therefore only consider other but not less important aspects of work which bear first upon the plants and crops we grow and secondly on the way we grow them. For, however pure or profound his study of plants, the scientist suffers from one fundamental necessity, he has to grow plants or have them grown for him. And under modern design and layout of experiments, capable of statistical analysis, plants have to be grown not only well but uniformly well. These questions have received detailed attention at John Innes.

Our methods of preparing composts, of handling plants, and growing commercial crops under glass, have received wide recognition and approval. They were designed to meet the needs of the gardener whether he grows commercially or in small numbers, since both the composts and methods used in handling plants make for sure and repeatable results and economy of materials. And these are of particular importance to us all in this present age.

The John Innes composts were first devised to meet our own needs. The partial failure of an important crop of *Primula sinensis* in 1933 through some sort of root rot had led us to use partially sterilized soil the following year in an effort to correct the trouble. However, results were worse rather than better, the root rot was not cured, even more serious, very many plants of weak genetic constitution and of great importance to the breeder, failed to grow. The problem was critical and an investigation was put in hand at once to determine the cause of the failure. We soon discovered why sterilized soil was then unpopular with gardeners and growers alike. Although sterilization killed off disease and pests it brought with it a host of other problems, perhaps worse than those it was meant to cure.

Failure of seeds to germinate and a check to plant growth were two of the problems, already well known to gardeners and reported upon by research workers but never fully investigated. The sterilizing check to seedling growth is more serious than is generally realized. Experiments later proved that a plant checked in this way never develops normally or catches up with non-checked plants. Flowering plants take longer to mature and with crop plants like lettuce and tomatoes, normal growth and fruiting is delayed with serious consequences to the grower.

A critical examination was then made of the materials we were using in our composts. And in those days it included in addition to loam, animal manure, leaf-soils, a variety of peats, mortar rubble, etc. One by one the compost ingredients were separately examined and separately sterilized using varying periods of time and varying sterilizing temperatures. The effect of using different fertilizers and different ways of applying lime were also tested in an effort to sort out the problem. From the many experiments made, two standard composts were devised and the formulae published as the John Innes composts. These were standard composts—the first of their kind—one for seed sowing and one for potting. They were designed to replace the complex mixtures often used for one kind of plant with a single mixture for all kinds of plants. So far as we were concerned as a research station it marked a big step forward and later proved to be just as important to growers as to ourselves. After twenty years of practical use by ourselves, by commercial growers, and gardeners, the formulae for these standard composts remains the same as in 1936. They have certainly stood the test of time and John Innes composts are used today by 80 per cent of nurserymen and gardeners.

One modification was made in 1954 to enable the same basic formula to be used for growing ericas, rhododendrons and other calcifuge plants, which in some cases had shown signs of chlorosis when grown in John Innes composts. In it the ¾ oz. of lime is replaced with the same amount of sulphur—the other ingredients remaining the same. Thus today we use ourselves, and recommend others to use, for all plants grown in pots, one basic compost only, made up from exact proportions of loam, peat and sand and a base fertilizer used in single, double or treble doses according to the kind and vigour of the plant we wish to grow. This compost, together with the slight modification already mentioned, is used at Bayfordbury for everything. And our experimental plants vary widely from plum trees in pots to primulas, streptocarpus to strawberries, blackberries to begonias and hundreds of other species too. By using standard composts, more uniform and reliable results are brought about and a great deal of the uncertainty of growing is removed.

The use of partially sterilized soil has now become standard practice in horticulture but both equipment and methods used in its preparation could in general be improved. At the time of our early experiments on standard composts no efficient equipment was available and a sterilizer was designed at Merton to meet the needs of the small grower. This John Innes Low Rate Sterilizer holds half-a-cubic yard of loam which can be raised to the required temperature in about half-an-hour. It is constructed of durable materials throughout and can be built by the average handyman. A specification of the materials and description of the sterilizer has been published (5).

Investigations have more recently been made on the steam sterilization of glasshouse beds also, in an effort to improve the methods in present use which are often inefficient. Sterilization of beds where

tomatoes are regularly grown is a necessity to destroy disease and pests and to restore soil fertility. The process is costly. As a result of these investigations definite recommendations can now be made and the term balanced steaming has been used to describe them.

It has been shown that the high pressures often used are not essential and lead to waste of steam and of money. The rate at which steam is passed into the soil should not exceed 18 lb. steam per hour per square foot of soil surface; equivalent to a pressure of about 2 lb. per square inch. It is as much steam as soil can absorb without waste. This low rate method has given savings in fuel of up to 30 per cent when compared with the more normal methods using high-pressure equipment. If steam is used at this low rate without any adjustments to the boiler and equipment, the soil will, of course, take longer to heat up. By the method recommended the full boiler output is balanced against the area of the grids in use and a low injection rate cannot be exceeded, which in turn makes for high thermal efficiency and lowers costs (6) and (7).

The early work on composts and soil sterilization has led to further investigations concerning the handling of plants generally, in an effort to speed up and make more certain the results of such simple processes as pricking-out and potting-on plants, etc. We appear to have little real knowledge about them. It was found, for instance, that delay in pricking-out plants after germination could lead to delay in the development of every sort of seedling, and to commercial growers of lettuces and tomatoes, to serious financial loss. Few of us realize how damaging a check to growth can be, since without exact experimental evidence it is almost impossible to observe. It is certain that without accurate weighing and measurement a difference of less than 10 per cent cannot be seen. And such a difference today would determine whether or not one would make a profit when growing some crops for market. Experiments have shown that early pricking-out in the case of the tomato crop can result in as much as 40 per cent gain of ripe fruit picked during the first three weeks of cropping. And this is when the crop pays best. Further, since early pricking-out increases rate of development, it must save both time and fuel. The rule to follow then with seedling plants is, prick them out as early as they can be handled, two or three days after germination.

Many experiments on simple cultural problems of this kind have been made at John Innes using tomato as a test plant, first because it is our most important glasshouse crop and again, it is a sensitive plant—a good test plant, unlikely to show growth and developmental differences which would not be more severe in other plants.

One series of experiments which provided useful information to the gardener who grows outdoor tomatoes, concerned the size of pots to use for raising his plants. We are familiar with the variation in size between young plants we buy or even the ones we grow ourselves for planting outdoors. What difference does this make to the crop we gather? Experiments show that the rate of development of the tomato plant raised in 2¾-inch pots up to 5-inch pots is proportional to the size of

pot used. One might expect perhaps that 5-inch pots would produce the best plants, although it is often not realized they do so in the same period of time. Comparing the tomato crop from the most popular size used, 3½-inch pots, with 5-inch pots, however, showed that 30 per cent more ripe fruit was gathered in the first four weeks of picking from those planted out at the same time but from the larger pots. A considerable difference, and one worth having from a crop which under average conditions does none too well outdoors.

From this kind of experiment we learned that although many tender plants put out in summer only spent a short time in pots under glass, it paid handsomely to grow them well during this short time. Good seedling growth has a profound effect not only on size before planting but on early flowering, early ripening and final crop. To put it in another way, growing in small pots slows down growth and development which is something not easily seen until perhaps too late.

Another aspect of cultivation which has been the subject of many of our investigations concerns the use of the soil block as a substitute for clay pots for growing many plants eventually planted outdoors or in beds under glass. The soil block is not new; it has been used for many years by the amateur grower of sweet peas, etc., but no scientific evaluation of its advantage or disadvantage for commercial crops had previously been made. These experiments have proved that properly made soil blocks are better than clay pots for many plants. For example, tomatoes, cauliflowers, lettuce, etc., raised for planting out. Plants get away and establish themselves more rapidly when planted from soil blocks. To get the very best results care is needed. The emphasis lies on making the block properly; good plants cannot be grown in badly made soil-blocks, and success depends on a correct determination of the degree of compression necessary to bind the compost together. Medium loam as recommended for John Innes composts, together with the other ingredients, will produce excellent soil blocks. The condition of the compost for block making should be slightly more moist than when normally used for potting. To get uniform growth throughout, the compost must be uniformly moist and uniformly compressed. There are many excellent machines on the market which make soil blocks of sizes approximating to the pots used normally for growing lettuce, tomatoes and other plants for planting out. The smaller sizes are particularly useful to the gardener with extensive bedding work who is anxious to get a good show of flowers in the shortest possible time. To the commercial grower both capital costs, depreciation and labour costs are less for blocks than for pots when used for raising such crops as cauliflowers, tomato, etc.

More recently, automatic block-making machines have been marketed which will make up to 1,500 soil blocks per hour. One of these machines has enabled us to handle much more economically and with greater uniformity the many thousands of plants we raise at Bayfordbury each year for ourselves.

The investigations, begun at Merton and continued at Bayfordbury on methods of cultivation, have demonstrated many advantages of adjustments to normal practice which could lead to growing better plants under glass. Although horticulture is still a craftsman's job this research clearly shows that a scientific study of its basic techniques can nearly always show better ways of doing things. And they are simpler to teach or learn and often represent a real economy in time and materials.

It has been abundantly clear throughout our experiments that light is a matter of fundamental importance in the growth of plants. Proper orientation of glasshouses, using large panes of glass supported by narrow roof bars and keeping glass clean, has shown clearly that light is the most serious limiting factor to good growth particularly in winter and early spring, the time when the majority of seedlings are raised. None of these adjustments are a matter of greater expense but they can add a lot to receipts in the form of better plants and crops.

Since natural light appeared to be such a limiting factor in our experiments, the question arose, could supplementary artificial light be used to get even better quality plants? The answer is it can. The first experiments on supplementary illumination at Merton were made with fluorescent tubes backed by reflectors and suspended above the plants. Provided light intensities 300–500 foot-candles were given for the correct number of hours each night as an addition to normal daylight, it was shown that excellent quality plants could be grown in winter and early spring. To produce sufficient light, however, several tubes must be arranged together. The apparatus then becomes clumsy and unless removed from above the plants during daylight may shade the plants and lessen the advantages brought about by the additional light. They do not work well in practice.

The possibilities of other sources of light were then examined, preferably compact fixed point lights of high intensity which would not need moving during daylight. Experiments were made with sodium and mercury-tungsten lamps and with high-pressure mercury vapour lamps which are frequently used today for street lighting. Of these, the high-pressure mercury vapour lamps proved to be the best all-round source of light. They are expensive to install and use and for this reason in practice can only be recommended for raising seedlings at a young stage when they can be closely set together. The effect of extra light improves the vigour and development of seedlings at this time and will result in quicker maturity of crops like lettuce or earlier fruiting of the tomato crop.

High-pressure mercury vapour lamps are now sold for the express purpose of raising better seedlings in the late winter and early spring. They consist of a horizontally mounted 400-watt lamp fitted into a reflector. Lamps are suspended 3 feet above bench level and 4 feet apart. The area illuminated at the correct intensity is about 4 feet by 3 feet, which is sufficient to accommodate 150 seedlings in 3½-inch pots or 200 in 3-inch pots. The period of daily illumination varies with the type

of plant grown. Cucumber will benefit from twenty-four hours' continuous illumination while tomatoes and some other plants require at least six hours unbroken darkness each day. In practice, seedlings are illuminated for about twenty-one days or until they require spacing. They are then grown normally, without additional light.

There is no doubt that the use of supplementary illumination represents an economic advance in horticultural practice and particularly so to the tomato and cucumber growers.

In the Merton and Bayfordbury experiments an additional ¾ lb. of tomatoes have been regularly gathered from illuminated plants during the first three weeks' picking; a figure which represents about 4½ tons of fruit per acre at normal planting distances and in cash, more than enough to pay for the installation of lamps in a single year. Supplementary light can be just as useful to the amateur gardener in producing much sturdier seedlings and also for bringing pot plants into flower at an earlier stage.

The destruction in 1944 by a flying bomb, of our glasshouses and laboratories at Merton only accentuated the move of the John Innes Institution to Bayfordbury. It had been realized for some years that our proximity to London with its bad winter light and smoky atmosphere made a move to the country necessary. We, too, were short of room outdoors for growing experimental crops and fruit. Among the many and varied questions to which we had to find an answer at that time was—What type of glasshouse should we build in our new home? How should we heat them? What shape should they be? etc. These were not easy questions to answer and we found there was little real information to guide us. Glasshouses have been used for the last hundred years, but few changes had been made in either their design, construction or heating which might enable the garden to use them with greater efficiency or with greater economy.

Investigations, therefore, were begun in 1943 to gather information which would enable us to build glasshouses which would provide some of the answers to these questions, and at the same time best meet our own requirements. These have already been described in the JOURNAL (8).

The Bayfordbury glasshouses are, therefore, of experimental design and were built to give information on such matters as the durability of materials used in glasshouse construction and their effect on heat losses; on the efficiency of natural light as determined by orientation, glass size and roof shape: comparisons, also, between low and high level heating pipes, etc. Thus one block of our glasshouses is built running approximately east to west and another block north to south. Some houses are built of timber typical of the majority of glasshouses, others are built of aluminium alloy, with steel supports; one is an American plant house and another of advanced type supported only with laminated arches and without purlin posts. Glass sizes vary between 48 inches by 24 inches and 16 inches by 12 inches (Fig. 34).

The glasshouse system is heated by low-pressure steam controlled

from motorized valves by thermostats so that accurate temperatures can be maintained throughout. Comparisons between hand and fully automatic systems of ventilation are also being made. It will, of course, be some time before final conclusions can be drawn as to the value of some of these comparisons but already it is clear that for the raising and cultivation of early crops, the east to west propagating house with its better natural light during the early months of the year, is superior to one running north to south. It has also been found that high-level pipes, that is, pipes situated about 8 feet from ground level, are as efficient as low-level pipes for warming the lower air and ground surface in glasshouses. Greater uniformity of heating is also obtained from high-level pipes. However, this may not be always of over-riding importance and low-level pipes may be an advantage where ground crops like tomatoes are grown.

Let us turn now to something quite different. The production of pure seed is a matter of great importance to the seed grower and to the gardener and the problems of producing pure seed have been the subject of many experiments by workers at John Innes. Complete uniformity in the hereditary qualities of seed cannot be obtained in practice. Uniformity depends on the way the plant breeds, whether it is self-pollinated like tomatoes or out-pollinated like radishes or on isolation by either distance or time of flowering.

Isolation by planting varieties of the same crop some distance from one another is the normal way of preventing contamination by cross-pollination. Its object is to separate the varieties to prevent the pollinating agent, whether insects or wind, from operating. Plot size in practice is known to have some effect on the amount of contamination which takes place. To find out how important distance or mass of plants is, investigations have been made at Merton and Bayfordbury by direct observations on the insects concerned in pollination, and by measurements of contamination in plants separated by varying distances, and in various size blocks.

The foraging instincts or habits of bees, the most active pollinators, are now well known. They work in a small area and so long as nectar is present in sufficient quantity, return regularly to the same area, or even the same plant. If then the area of a variety offers the bee population sufficient nectar we should not expect bees to wander far or much cross-pollination to take place. Observations show this to be true not only with bees but with other pollinating insects as well. As an example, measurements of contamination were made with radishes and turnips, both obligatory cross-pollinators, which would show maximum contamination.

Experiments were made using blocks of one variety of plants with arms of a single line of another variety running at right angles to the main block. The proportion of contamination resulting from cross-pollination by the block of plants was determined by examination of seedlings raised from the plants growing in the arms. At a distance of

40 feet from the main block contamination falls to 1 per cent compared with 60 per cent at a distance of 1 foot. This closely follows observations of the bees and other insects; they move pollen no further than is necessary for their own purpose of collecting it or collecting nectar. The experiments showed that when large masses of plants are grown for seed, quite small distances between varieties will control serious contamination. When smaller plots are grown the distance necessary to get the same result becomes much greater. It is for this reason that amateurs saving seed from a few plants must be certain that other plants likely to act as pollinators are not growing within several hundred yards if they want their plants to come true.

Wind will disperse pollen more widely than bees but it does not seem to do so in amounts which could greatly contaminate plants like beet or sweet corn. When pollen from sweet corn was trapped and counted at various distances on the leeward side of the crops—at 10 feet only one-tenth the number of pollen grains were caught and at 80 feet only one-thousandth as many as within the plot itself. Very large distances between plots do not, therefore, appear necessary with these crops.

Experimental results show that the safe rule to follow in growing seed is first careful rogueing and selection, then separate varieties by about 50 yards when growing seed of commercial quality. For stock seed the minimum distance should, of course, be much greater.

A further point of great importance to the gardener concerns the storing of seeds. Many experiments on factors which influence the vitality of seeds, such as temperature, humidity, etc., have been examined. An investigation was started in 1945 to study the genetic effects of ageing seeds. Seeds of *Primula sinensis* were stored in sealed bottles of CO_2 together with a control in unsealed air, and allowed to age at ordinary room temperatures. Samples of these seeds have been sown at intervals since 1949. By 1952 germination was nil in unsealed air but still 50 per cent in sealed CO_2. The maintenance of reasonable germination after seven years' storage is important to both the plant breeder and the grower. The experiments have been extended to include many vegetable seeds stored unsealed and sealed in air and in CO_2. In all the cases examined seeds stored in CO_2 have given much better germination. Even parsnips, which you will know lose their viability very rapidly, gave 40 per cent germination after four years' storage and onions 71 per cent. Of equal importance, no significant differences have so far occurred in the yields of mature plants raised from these seeds.

During the war years extensive trials were made with outdoor tomatoes to determine the best varieties to grow.The tomato crop was then, of course, even more important than it is today. These trials have shown that the best indoor varieties are not necessarily the most suitable for outdoor cultivation where early ripening is a point of greater importance than total yields. The two outstanding varieties throughout the trials were 'Harbinger' and 'Exhibition', the former invariably

ripening earliest and the latter producing the heaviest crop. These varieties are still two of the best sorts to grow outdoors.

Investigations were also made on the ripening of green tomato fruits which in bad summers represent an appreciable percentage of the total crop. They showed that temperature is the over-riding factor in ripening, light itself having little beneficial effect. Temperatures of 70° F. shortened the period of ripening and were most useful commercially, but 54° F. is the most suitable temperature for the amateur who needs to ripen green fruits slowly. Lower temperatures will invariably lead to heavy losses through the breakdown of the fruits. 'Harbinger' also ripens more quickly than any other variety when gathered green and brought indoors.

The problem of rogues in tomatoes has for many years interested research workers at John Innes. Rogues occur in almost all varieties in lesser or greater degree; their numbers may even vary in the same variety if sown at different times or temperatures.

Rogues can be recognized at the time of planting out by their deeper green leaves, shorter internodes and stockier growth. Closer observation shows that they can in most cases be distinguished from normal plants at an early stage by an examination of the first true leaves when about an inch long. In rogue plants they are a pair in size and appearance while in normal plants the first leaf is much larger than the second. Experiments show that the occurrence of rogues is affected by the temperature used both at germination and up to the time of the appearance of the first true leaf. For instance, 'Ailsa Craig' gave 12·9 per cent rogues when raised at 77° F. but only 1·7 per cent when raised at 56° F. Seeds saved from plants grown at a high temperature also gave more rogues than plants growing at a lower temperature. It was shown, too, that seeds saved from the first two fruit trusses gave less rogues than from the third and fourth trusses of fruits.

To lower the occurrence of rogues, therefore, three important points should be observed—seed should be saved from the bottom trusses of normal plants; seeds should be germinated and the plants grown at a reasonable temperature and careful selection of plants should be made at pricking-out time. Attention to these points represents a considerable economy in compost, fuel and glasshouse space to the commercial grower of many thousands of plants and to the amateur grower as well, since rogues produce both a later and smaller crop of fruits.

During experiments on rogue plants grown in a controlled environment, it was also found that temperatures during inflorescence differentiation in normal tomato plants affected the number of flowers formed on the truss. For instance, the variety 'Potentate' averaged 9·5 flowers at 60–62° F. but only 6·3 flowers at 74° F. The temperature sensitive period for the first truss is from the fourth to the twelfth day after the cotyledons expand.

Treatments given up to the time the plants are about 5 inches high

have affected the number of flowers of the first five fruit trusses, the most profitable period of the plant's life.

These investigations emphasize the importance of another cultural problem, avoid using high temperatures when raising the tomato crop.

The breeding of tree fruits at the John Innes Horticultural Institution has been in progress since its earliest days. Such studies, as, indeed, all projects relating to tree fruits, are necessarily long-term experiments and practical results in the form of new varieties are unlikely to occur rapidly. However, a number of cherries, apples and pears raised at Merton are today being planted commercially and other seedlings that appear promising are under test.

The apple varieties already named are 'Merton Worcester', 'Merton Prolific', 'Merton Russet', and 'Merton Beauty'.

Both 'Merton Worcester' and 'Prolific' have received the Award of Merit and the former has been extensively planted.

From the cherries, 'Merton Biggareau' has received a First Class Certificate and the Merton varieties 'Glory', 'Bounty', 'Favourite', 'Heart', and 'Premier' have received Awards of Merit. These varieties have all been planted for commercial use.

The three blackberries 'John Innes', 'Merton Early', and 'Merton Thornless' have also received awards.

Several strawberries raised at Bayfordbury are of great promise and one selected for further trial has been named 'Merton Princess'. Its capacity for high yields of good fruit and resistance to mildew are points of great importance.

A number of woolly aphis-resistant rootstocks, raised jointly with the East Malling Research Station, are now being distributed by nurserymen. Some fourteen of these selections known as the Malling-Merton series are gradually coming into commercial use. They are an important contribution to the prevention of one pest of our orchard fruits.

Plants were raised at Bayfordbury in 1951 from pollinations between pears and apples. This unusual cross had been attempted many times previously but without success. The plants are of great interest and we look forward to the time when they produce fruits.

The systematic use of hybrid vigour in producing new varieties of sweet corn and tomatoes has been applied for some years in breeding better crops.

The hybrid varieties of sweet corn 'John Innes I' and 'II' are examples. They produce both early and high quality cobs. Earliness is particularly important with this crop in our climate.

The hybrid tomato varieties 'Hertford Cross' and 'Ware Cross', have given in trials and under commercial conditions, earlier and better quality fruits and higher yields than either of their parents or other varieties tested with them. They are the first strains eligible for registration under the new hybrid seed certification scheme. Varieties resistant

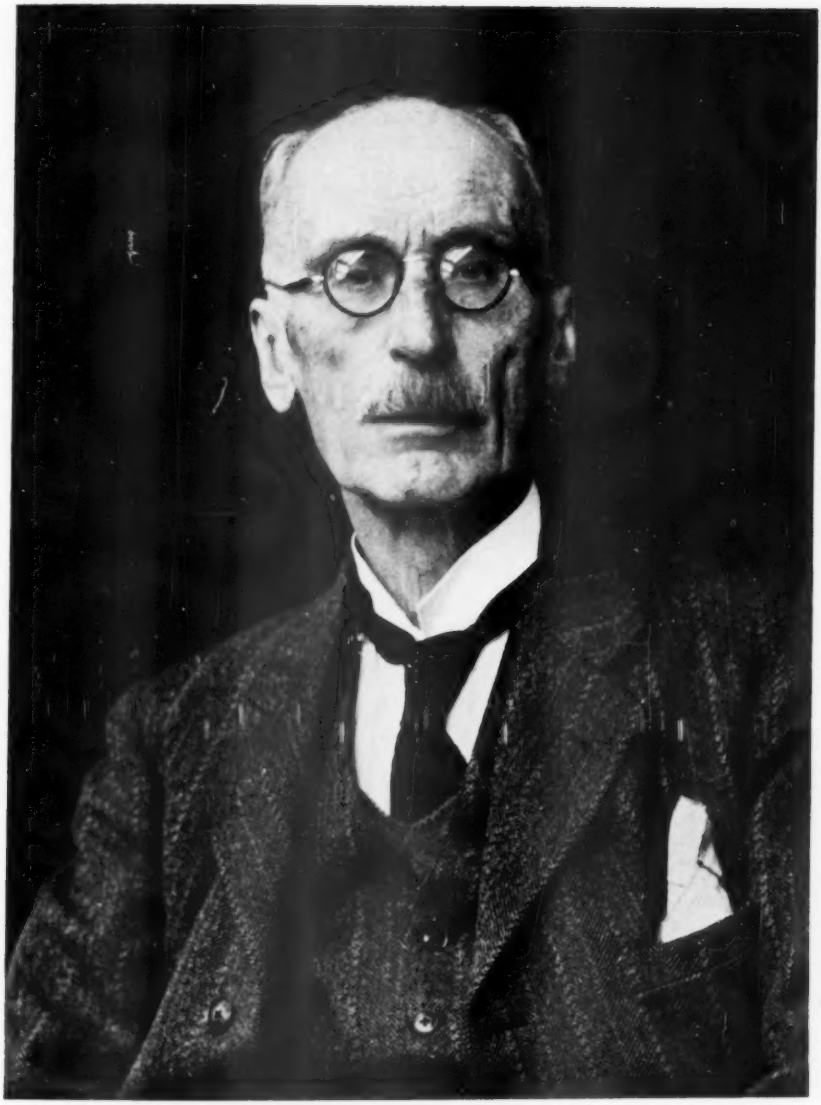


FIG. 30—PROF. SIR WILLIAM WRIGHT SMITH, F.R.S., F.R.S.E., V,M,H., on his eightieth birthday (See p. 103)

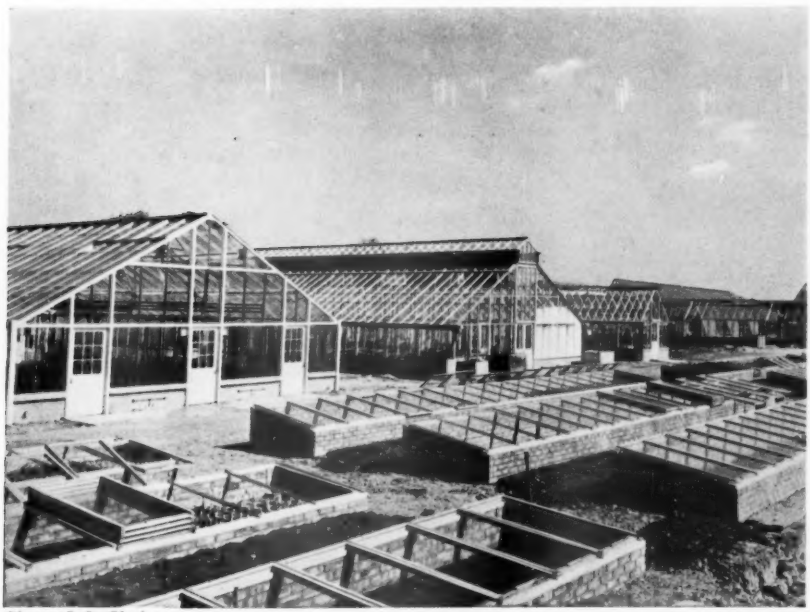
THE JOHN INNES INSTITUTION AND ITS WORK

FIG. 31—The Manor House, Merton, Surrey. The home of JOHN INNES (See p. 107)

Photo, Sport & General Press Office, London

FIG. 32—John Innes Horticultural Institution, Merton, Surrey, 1910–1950. Main entrance and laboratory buildings (See p. 107)

FIG. 33—Bayfordbury, Hertford. The Mansion, now converted to laboratories and administration (See p. 108)



Photos, S. L. Clarke

FIG. 34—Bayfordbury. General view of the experimental glasshouses (See p. 114)

FIG. 35—Bayfordbury. The E–W uneven span propagating house

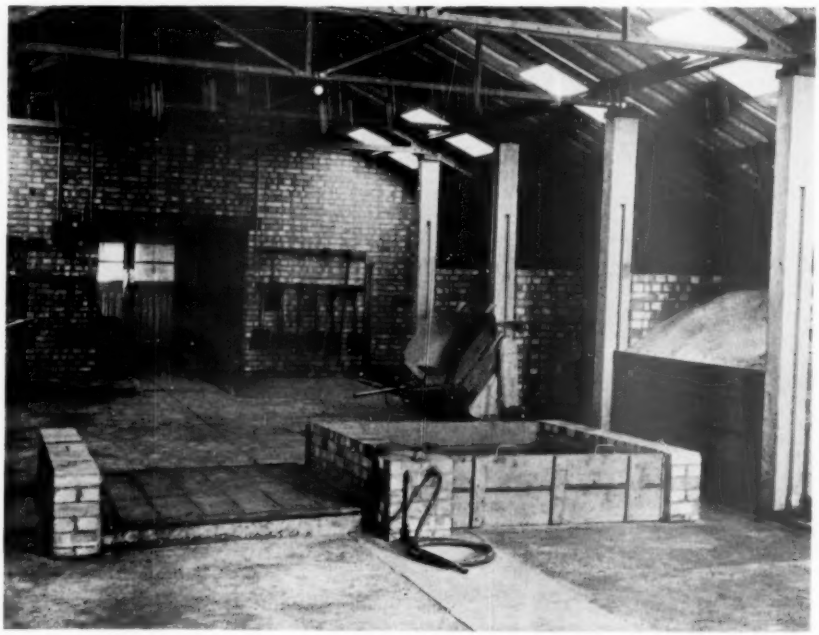


FIG. 36—Bayfordbury. Sterilizing shed and equipment for preparing J.I. Composts

THE JOHN INNES INSTITUTION AND ITS WORK

FIG. 37—Bayfordbury. The south front seen through part of the National Rose Species Collection (See p. 119)

FIG. 38—Bayfordbury. Part of the Old Shrub Rose Collection. A border of hybrid musk roses (See p. 119)

FIG. 39—Bayfordbury. The East corridor, three years after planting

FIG. 40—*Crocus biflorus weldenii* **A.M.** February 28, 1956. Exhibited by Messrs. Hillier & Sons (See p. 135)

Photos, J. E. Downward

FIG. 41—*Cyclamen pseudibericum* **A.M.** March 13, 1956. Exhibited by The Joint Garden Committee, Myddelton House Gardens, Enfield (See p. 135)

Photo, J. E. Downward

THE REGINALD CORY MEMORIAL CUP, 1956

FIG. 42—*Paeonia* × 'Emma', shown at the Chelsea Show, 1956. This cup has been awarded to SIR FREDERICK STERN, O.B.E., M.C., F.L.S., V.M.H. (See p. 54, February 1957 JOURNAL)

FIG. 43—*Campanula ephesia* **A.M.** July 3, 1956. Raised from seed collected by DR. P. H. DAVIS and shown by Messrs. W. E. Th. Ingwersen Ltd. and the R.H.S. Gardens, Wisley (See p. 134)

to leaf-mould have also been distributed under the names 'Antimold A' and 'B'. They have proved particularly useful in the north of England where this disease is most severe.

The dwarf tomato 'Puck' was raised at Merton. It is notable for its free-setting qualities even in bad low-temperature conditions and is especially useful for growing under cloches.

Mention must also be made of the dwarf rice bean 'Merton Haricot', a compact variety particularly suitable for machine harvesting.

This list gives a glance of the scope of the breeding work and some of the benefits which result directly to the practical grower from investigations in this particular field.

The work on problems of incompatibility in orchard fruits has more recently been extended. It is well known that one of the causes of failure to set fruit is due to the inability of pollen tubes to reach the ovary. Why do they fail to grow? The cause has in recent years been traced to substances present in the styles and pollen grains which are antagonistic to one another and prevent normal growth of pollen tubes and eventual fertilization. Experiments at Bayfordbury have shown that these substances can be destroyed or made harmless by X-rays and thus make seed-setting possible.

The technique has been applied to cherries, apples and pears and some of the young trees have already commenced to bear fruit.

For the first time we have a number of self-fertile cherries although at the moment the fruits are not of the same quality as our best varieties. Since only a few crosses between good varieties are better than their parents, this is no surprise. Large families of crosses between the new self-fertile cherries and commercial varieties have now been raised, from which it may be possible to select better quality varieties.

The growing of these self-fertile cherries will make it unnecessary to interplant two or more varieties as we do now in order to get fruit. It will simplify both planting and management and should help reduce the costs of the commercial grower and enable the amateur gardener to plant a single cherry tree, which is all he normally has room for, with a fair chance of getting regular crops.

The Agricultural Improvement Council began a scheme in 1945 to establish collections of shrubs, roses, bulbs, etc., with the object of co-ordinating research on practical problems of interest to the plant breeder and grower of our more important horticultural plants. As part of this scheme the National Rose Species collection is now established at Bayfordbury in large informal beds bordering a grass walk east of the glasshouses. It contains the largest and best authenticated collection of rose species ever brought together, thanks to the help of private collectors interested in these delightful shrubs and to nurserymen and the Botanic Gardens. A second and perhaps even more interesting collection of old shrub roses fills the beds of the original rose garden at Bayfordbury. A description of these collections has already appeared in the JOURNAL (9) (Figs. 37 and 38).

This cup has been awarded to SIR FREDERICK STERN, O.B.E., M.C., F.L.S., V.M.H. (See p. 54, February 1957 JOURNAL)

seed collected by Dr. P. H. DAVIS and shown by Messrs. W. E. Th. Ingwersen Ltd. and the R.H.S. Gardens, Wisley (See p. 134)

A number of problems relating to breeding and propagation of roses are also under investigation. Experiments on the rooting of rose cuttings, for instance, which in most cases are difficult, have shown that the use of hormones will produce double the number of plants.

Other tests show that the germination of seeds of the dog rose used for understocks can be made more certain by artificial cold treatment. Briefly, the method used is to clean and stratify the seeds in vermiculite as soon as harvested. They are then placed in a warm house for two months, and transferred to a refrigerator for a further two months, then sown in the normal way.

As you know, most of our garden roses are budded on stocks of selected wild species raised from seeds or cuttings. Many cannot be grown on their own roots.

A variety of rose stocks budded with some of our best garden varieties and planted in different soil types, are being used at Bayfordbury to test the stock/scion effect on questions of vigour, susceptibility to black spot and mildew and cold resistance. First results suggest that these problems are connected with the type of stock used. They will be of interest to all rose growers.

A further expansion of the Institution's work is now taking place. DR. DARLINGTON left us in 1953 on his appointment as Sherardian Professor of Botany at Oxford, and a year later DR. KENNETH DODDS, until then Director of The Potato Genetics Station at Cambridge, came to Bayfordbury.

DR. DODDS brought with him the Commonwealth Potato Collection. This collection was made in 1939 to provide material for a study of variation in the tuberous solanums and as a reserve of material for cytological research and experimental breeding. It may one day influence the breeding of new potato varieties.

This addition to our plants and work has made it necessary to build a new block of glasshouses and to make extensive alterations to the mansion to provide laboratories for the additional staff.

In this survey it has been possible to discuss briefly only a few of the investigations made previously at Merton and in the last few years at Bayfordbury.

Other investigations have included virus studies in tulips, work on silver leaf and canker in plums, flower pigment studies in a number of plants, the use of Colchicine and other drugs to produce new plants and numerous cultural and taxonomic studies, etc. The wide range of activities allowed by its foundation have been fully used by workers of the Institution.

Finally, the Institution retains today much of its character and work as determined by its first Director. Plant Breeding, Genetics and Cytology are still its main work in one form or another and with new techniques and methods coming into use and new tools to use to help the research worker, such studies may well continue to be its main occupation.

REFERENCES

(1) M. B. CRANE, F.R.S., V.M.H., "The origin and improvement of cultivated plants". R.H.S. JOURNAL, **75**, 426; **75**, 465.
(2) SIR FREDERICK STERN, O.B.E., V.M.H., "Cytology and Horticulture". R.H.S. JOURNAL, **77**, 394; **77**, 433.
(3) ANN P. WYLIE, "History of Garden Roses". R.H.S. JOURNAL, **79**, 555; **80**, 8; **80**, 77.
(4) R. L. DE VILMORIN, D.ÈS.SC., "The Improvement of Strains of Vegetables". R.H.S. JOURNAL, **81**, 338; **81**, 386.
(5) "The John Innes Low Rate Sterilizer", *The Fruit, The Seed and the Soil.* Oliver & Boyd (1954).
(6) *The John Innes High Rate Sterilizer.* Oliver & Boyd (January 1955).
(7) *Balanced Steaming of Glasshouse Soil.* Oliver & Boyd (April 1955).
(8) W. J. C. LAWRENCE, O.B.E., V.M.H., "Glasshouse Design and Management". R.H.S. JOURNAL, **80**, 358.
(9) G. D. ROWLEY, "The National Rose Species Collection". R.H.S. JOURNAL, **79**, 382.

THE CONTROL OF THE MORE IMPORTANT DISEASES AND PESTS OF FRUIT

F. W. Webb, N.D.H.

(*Lecture given on November* 27, 1956, MR. T. NEAME, V.M.H., *in the Chair.*)

IN this paper I propose to deal with some of the troubles with which almost all gardeners have to contend in cultivating high quality fruit. There may be some diseases or pests which are troublesome in certain localities which I shall not mention.

The first disease common to almost every district where apples are grown is

APPLE SCAB

We now know a good deal about the life history of this disease. Quite briefly and in non-technical language we know that most of the infection is carried over on fallen leaves lying in the grass or on bare ground. Some infection is carried over the winter on the young shoots of softer-wooded varieties, and this can be the cause of die-back and canker in varieties such as 'Cox's Orange Pippin' and 'Worcester Pearmain'.

Scab spores are liberated in early April, in most cases following the first soaking rain which occurs after a dry spell in March. Under such weather conditions there are short periods when the atmosphere is full of spores which will carry long distances in air currents. Such spores settling on leaves and young shoots will germinate quickly particularly under warm and damp conditions and it is not long before the familiar black masses of active Scab fungus are seen growing on the foliage. Later in the season the Scab spots appear on the fruitlets.

It is now known that it is possible to control Apple Scab by eradicating Scab spores immediately following an infection period. There is only one chemical available for this purpose, viz. mercury. Various phenyl mercury salts are used by professional fruit-growers, but as these fungicides are poisonous they are not readily available to amateur growers and I shall therefore confine my remarks mainly to Scab control by the use of protective chemicals.

Two fungicides which have been used for many years are sulphur and copper. Copper is now rarely used because of its damaging properties. Sulphur is, however, still widely used in the form of lime sulphur and wettable sulphur. A third protective chemical captan was made available to private gardeners in the spring of 1955 and is now preferred by all who wish to grow high quality apples and pears, particularly for show purposes.

Lime sulphur and captan are both highly efficaceous fungicides, but lime sulphur possesses the serious disadvantage of causing russeting and cracking, particularly under dry and cold weather conditions or hot, dry conditions, and also when used with high amounts of wetting agents or with miscible insecticides containing a good deal of wetting agent.

Captan on the other hand is a completely harmless material giving rise to large soft leaves and fruit possessing a fine gloss and finish. Such varieties as 'Beauty of Bath', 'Worcester Pearmain', 'James Grieve', and 'Cox's Orange Pippin' have shown a remarkable increase in crop weight and fruit quality following the use of captan. The main drawback to the use of captan is that it does not control Apple Mildew. In this respect it does not compare favourably with sulphur, but recent research has shown that captan and Karathane* or sulphur can now be used together to produce the good effects of captan without losses from Apple Mildew or russeting from sulphur. I will deal with this point in greater detail when I talk about Apple Mildew.

Both captan and sulphur must be applied to provide a protective cover on leaves and fruitlets before Scab spores make contact with them. Once Scab is growing in the leaf or fruit there is little hope of eradicating it with sulphur or captan. This means that for successful results spraying against Scab must commence before the first appreciable rain following bud burst, and successive applications made at ten- to fourteen-day intervals to maintain a protective covering until the danger of Scab infection no longer exists.

Commercial growers will make as many as ten to twelve applications in a troublesome Scab year. Few private gardeners are able to spray as often as this, but every effort should be made to apply three sprays before full blossom and two or three following the full bloom period. It is no longer advisable to refer to Scab spraying intervals by blossom stages as these may vary considerably by reason of weather

* Karathane is a registered trade mark of Rohm & Haas Company, U.S.A. It is based on dinitro capryl phenyl crotonate.

conditions. It is far safer to spray regularly at ten to fourteen-day intervals and, if necessary, to spray with captan or captan Karathane mixture during full bloom. Captan is used at the rate of 1 ounce wettable powder* to 5 gallons water. Lime sulphur is used at a progressively reducing concentration commencing at 1 quart to 10 gallons and reduced to 16 fluid ounces to 10 gallons for all post-blossom applications.

APPLE MILDEW

Since the introduction of captan and other organic fungicides for the control of Apple Scab a number of people have been disappointed because of the increase of Apple Mildew. It is true that captan, unlike sulphur, does not control Apple Mildew but this is not the whole story. Apple trees growing under well balanced conditions, both nutritionally and physically, rarely suffer from Apple Mildew. Such factors as mineral deficiencies, poor soil texture resulting in lack of humus, poor qualities of water retention, are all predisposing factors towards Apple Mildew. The extremely dry spring weather experienced in the past two or three years has also favoured Apple Mildew.

Special attention has been paid to the problem of control of Apple Mildew by research workers during the past two years. The results of this work can be briefly summarized as follows.

The most important manner in which Apple Mildew overwinters is in the form of mycelial infection in the buds. It is possible to tell during the winter with reasonable accuracy which fruit buds are infected. We have found that buds which are thin and pointed are always infected with Apple Mildew, while fruit buds which are plump are rarely infected. Infected buds become very obvious at green- to pink-bud stages because of the white spore-covered foliage. Almost all the spread of Mildew which will give rise to mildewed fruit buds in the following year takes place at bloom time and for a period of approximately one month after blooming.

Trials carried out at three centres in 1955 in which four applications of Karathane were made, viz:

(*a*) Pink Bud;
(*b*) Full Bloom;
(*c*) Petal Fall;
(*d*) Ten days after Petal Fall,

show a great reduction in primary fruit bud infection in 1956 as compared with a captan treated plot. This shows that if buds are protected during this period they are unlikely to become infected at a later date.

A further interesting point which arose from these trials is that both in the Karathane and captan plots the amount of secondary Mildew on leaf and shoot was very similar by the middle of August. This suggests that the amount of Mildew present in late August bears little or no

* Contains 83 per cent captan.

relation to the number of fruit buds which will be infected in the following spring.

Work both in this country and on the Continent suggests that a high amount of secondary Mildew present on the tree in late summer is due to weather conditions. Hot, dry spells are very favourable to the spread of secondary Mildew, and the shoot tip infection may occur under such conditions. Late season infection often appears very alarming but is, in fact, not so serious as Mildew which appears at blossoming time. Where it does occur, the carry-over to the following season can be prevented by pruning out shoots with infected tips.

Karathane should be applied together with captan (for Scab control) at the following rates. Karathane 1 oz. wettable powder, captan 1 oz. wettable powder in 5 gallons water.

During 1956 several cases of pears infected with Mildew were brought to our notice. This infection has been confirmed as the same Mildew species which is present in apples and control measures are similar.

APPLE CANKER

This is still a common disease and is caused by a number of different fungal organisms. The most serious damage is caused by *Nectria* species which cause most of the Cankers on the main branches.

The control of Canker is found mainly in cultural measures. Susceptible varieties such as 'Cox's Orange Pippin', 'Worcester Pearmain', 'Peasgood Nonsuch', etc., should not be planted in cold heavy soils in districts subject to high rainfall. Cultural care is necessary in manuring with a view to developing a well-balanced tree nutritionally. Any tendency towards soft lush growth will often predispose the tree to Canker. Canker infection often follows an attack of Woolly Aphid and every effort should be made to control this pest.

Some forms of Canker which occur on very young shoots and spurs are associated with the fungal organisms responsible for fruit rots of various kinds. One of these is *Gloeosporium* or lenticel fruit rot, which causes a "papery bark" type of spur or shoot Canker. Damage from this species can be greatly minimized by spraying twice at fourteen-day intervals with captan during August. This spray treatment will give a considerable reduction in *Gloeosporium* storage rot on the fruits.

PEST CONTROL

For many years the foundation of a successful season's pest control has been established by spraying in the dormant season with either tar oil or DNC/petroleum sprays. Alternatively, a thiocyanate spray can be used immediately after bud burst.

These sprays will give a complete control of Aphids and Apple Sucker, and a substantial measure of control of Winter Moth Caterpillars, Capsid Bug, and Red Spider.

Of recent years there has been a tendency to replace the use of winter washes with an insecticidal spray applied between bud-burst

and green-cluster stages. A combined BHC/DDT emulsion properly applied at this period will give a good control of Aphids, and Tortrix Moth Caterpillars; where Winter Moth Caterpillars, Apple Capsid, and Apple Sucker are troublesome a second application between the green-cluster and pink-bud stages will be found necessary.

A great deal might be said regarding the advantages and disadvantages of winter washing versus spring spraying. As is so often the case, all the advantages and disadvantages are not equally opposed although it must be admitted that the spring spraying is cheaper, cleaner, and more pleasant to apply than winter washes.

Such factors as one's available time, damage to undercrops, e.g. to green winter vegetables and flowers by tar oil, or to vegetables and blackcurrants from BHC taint from spring spraying, should be considered before deciding which spray to use. It is always a sound policy where there are alternative spraying materials to ring the changes fairly often. In this way one maintains a more balanced predator and parasite population and the possibility of pests building up a resistance to particular insecticides is minimized.

Pests which are not controlled or only partially controlled by winter washes or spring sprays are Red Spider, and Codling Moth. The bright red eggs of Red Spider can be easily seen on the trees during the winter and if there are many of these it is advisable to spray the trees with a thiocyanate wash immediately at bud burst. This will not only control Red Spider but also Aphids, Caterpillars, Apple Sucker, and Capsid Bug. If an infestation of Red Spider should occur during the summer period, liquid derris applied twice at seven-day intervals will give a good measure of control. Where a large area of trees is involved, summer ovicide sprays such as are used by commercial fruit-growers are available; these chemicals are sold under trade names and are based on either chlorfenson or chlorbenside.

Codling Moth is an annoying pest which appears to change its habits fairly frequently. During the past year or so attacks of Codling Moth have occurred later in the season. During the cold summer of 1956 Codling Moth damage occurred from June to September and the only reliable guide to timing the spray application was to examine the foliage and fruit for the eggs of Codling Moth. The most suitable material to use is DDT and in a normally warm summer an application made during the first week in July will be found beneficial.

SOFT FRUITS

STRAWBERRIES

This popular garden fruit is subject to many ills. The first essential is to plant virus-free stock obtained from a reliable source and to plant on clean land which has been generously manured. A strong vigorously growing plant is half the battle in avoiding many of the ills to which strawberries are subject. Among the diseases which can be controlled by spraying are: Botrytis fruit rot and Mildew on the foliage.

Botrytis Fruit Rot. This can be controlled by spraying with captan. Several applications are necessary but the results are well worth while, particularly in a wet season. The first application should be made when the first flower buds are about to open and two or three further applications made at seven-day intervals.

Mildew. At the first sign of the dark blotches on the leaves, which have a tendency to curl, spray with Karathane. This is a good eradicant and will clean up an infection. Repeat the application if re-infection occurs. Lime sulphur at 2 per cent is also a preventive spray.

Weevils. There are several weevils which often cause serious damage. Those occurring most commonly are Blossom Weevils (*Anthonomus*) Stem-cutting Weevil (*Rhynchites*) and Root Weevils (*Otiorrhynchus* sp.). Fortunately for control purposes these can all be present on the foliage together just before blossoming and an application of DDT will be effective.

Slugs. There are a number of formulations of metaldehyde available. Under conditions of reasonably fine weather the liquid slug killer is very effective. When rain is very persistent the pelleted preparation is more durable and very easy to apply.

BLACK CURRANTS

Big-Bud Mite. The old treatment of lime sulphur at 2 per cent at the grape stage has not been replaced by newer chemicals. Many new materials have been tried, but so far nothing is as effective as lime sulphur in spite of its tendency to damage.

Black Currant Sawfly. This pest is similar to the closely related species which attacks gooseberries. Damage can be extensive and occur in a comparatively short period. Bushes can be almost defoliated by the large numbers of caterpillars which feed on the leaves. Control is not difficult if spraying is carried out at the first sign of eggs laid on the backs of the leaves. Any formulation of DDT is effective.

Aphids. Tar-oil winter wash is still the most effective control of the various species of Green Fly which attack black currants. Never use BHC or lindane as this will give rise to taint in the fruit.

GOOSEBERRIES

Gooseberry Mildew. This has always been a disease associated with private gardens. Lime sulphur is effective in controlling the disease in most varieties other than the yellow sulphur-shy ones.

The advent of Karathane has now made Mildew control much easier as this material unlike sulphur has no damaging effects on the yellow varieties.

Gooseberry Sawfly. Another common pest which is now controlled very easily by DDT if applied as soon as damage from the caterpillars is commenced.

There are usually two broods of this pest and control of the first will minimize the second brood attack.

NOTES FROM FELLOWS

Christmas Freaks?

A WINTER stroll round the garden will nearly always bring certain delightful surprises, in the discovery of some daring herald of the spring that has woken from its winter sleep quite out of season. With pride may we place on the writing-table for Christmas a small nosegay of primroses that a sheltered nook will often disgorge.

Here a good few grape hyacinths and anemones will always be found in the river garden mingled amidst the carpets of snowdrops and aconites and *Iris histrioides* for the new year. The early-flowering shrubs are a delight and we count on the most adventuresome through the last days of the old year.

But what, indeed, was the long spray of yellow blossom that caught the eye this morning through a window of a top floor? On one of the south walls of this castle in a sheltered right-angle a thick entanglement of two plants blanket a projecting parapet and chase on up beyond to drape the windows of the floor above, quite 60 feet high. Both flower profusely in their season. One is *Buddleia auriculata* and the other the double yellow Banksian rose.

The buddleia is almost over now, but could this month often boast of sprays of species roses in full bloom? And most especially in what is reputed to be the coldest part of Ireland.

THE COUNTESS OF ROSSE

Birr Castle,
Offaly, Eire.
January 7, 1957

AWARD OF GARDEN MERIT—XCII

G. E. Peterson

436 FORSYTHIA × INTERMEDIA 'LYNWOOD'

Award of Garden Merit, June 19, 1956

A garden in early spring without a forsythia of some kind would surely be incomplete. The rich yellow masses of *F.* × *intermedia* var. *spectabilis* and the more graceful *suspensa* are a familiar sight in most gardens during March and April. *F.* × *intermedia* 'Lynwood' is, however, not yet so well known, but by reason of its larger and more numerous flowers is a better garden plant. The flowers are borne in clusters of two to six all along the previous year's or older wood.

'Lynwood' arose as a branch sport on a plant of × *intermedia* var. *spectabilis*, which was noticed in the garden belonging to MISS ADAIR, Cookstown, Co. Tyrone, N. Ireland. Plants of 8–10 feet in height and as much through with a less straggly habit than *suspensa* may be formed

by this variety. It seems to require less pruning than either *spectabilis* or *suspensa*, but when necessary old or crowded wood may be removed soon after flowering. As is the case with all forsythias, 'Lynwood' may be propagated easily from hardwood cuttings in October and also from the tips of shoots put in a warm frame in late June.

437 VIBURNUM × BURKWOODII

Award of Garden Merit, June 19, 1956

Viburnum × *burkwoodii* was raised in 1924 from a cross between *V. utile* and *V. carlesii* by Messrs. Burkwood and Skipwith at Kingston-on-Thames. Five years later in 1929 it received an Award of Merit as a hardy flowering shrub and now after all these years it has received a well-deserved Award of Garden Merit.

V. × *burkwoodii* is evergreen, as is its seed parent *utile*. The ovate pointed leaves which are a dark glossy green on the upper surface and covered with thick down underneath, are 1½–4 inches in length and about half as wide. The highly fragrant flowers are carried in terminal clusters of about 2½–3½ inches in width in the latter part of April and in May. The individual flowers are tubular and about ½ inch wide, pinkish at first, but pure white when open. *V.* × *burkwoodii* forms a compact bush of 4–6 feet in height and is kept in shape with very little pruning. Cuttings of half-ripened wood root quite readily, especially if given a little bottom heat. As for cultivation, this hybrid appreciates a rich, well-drained but not dry soil and has the great quality of being able to thrive in sunless sites; it is also valuable in town gardens, as it tolerates a smoky atmosphere, unlike so many other evergreen plants.

438 POTENTILLA FRUTICOSA BEESII

Award of Garden Merit, May 1, 1956

The potentillas or shrubby cinquefoils which belong to the Rose family are worthy of a place in any garden as they possess many of the virtues that are expected of a flowering shrub. They are hardy, easy to grow and have a very long season of flowering.

Potentilla fruticosa beesii is a dwarf silver-leaved form of *fruticosa* and forms a plant of 12–18 inches in height and 2–3 feet across. The leaves, grey in colour, are smooth on the upper surface, but covered with numerous little hairs on the under side. These pinnate leaves are usually made up of five to seven leaflets ½–1 inch long. The buttercup yellow flowers are similar to small single roses and are ¾–1¼ inches in width. They are carried singly or a few together on the current season's wood at the ends of the much-branched stems and may be seen from the end of July until well into October.

In these days when there is so much emphasis on labour-saving gardens and plants, such plants as *Potentilla fruticosa beesii* are invaluable. This is a good shrub for the front of borders and for rock-gardens. It thrives in almost any soil and often where more particular

plants would fail. To keep the plant well shaped and to encourage new shoots, the older growth should be thinned out in March. If a really dwarf plant is desired, the plant may be cut to the ground each spring. Hardwood cuttings inserted in a cold frame or out-of-doors in the autumn, root easily and provide the best method of increasing stock.

439 ACER PALMATUM DISSECTUM

Award of Garden Merit, July 7, 1956

The hardy Japanese maples give much varied interest in both habit and form to a garden at all times of the year; from the spring when their leaves first appear to the autumn, when they turn the most brilliant shades of gold, bronze and crimson, and also in the winter months on account of their interesting branch formation. *Acer palmatum dissectum* is a dwarf tree-like shrub. It is slower growing than *palmatum* and plants of more than 4 feet are seldom seen, except on exceptionally rich and favourable soils. When in leaf, it forms a round headed, umbrella-shaped tree, with twiggy, slightly pendulous growth.

The glabrous leaves, which are a bright green in colour for most of the season, are slightly tinged with purple in the young stages, and turn to brilliant shades of bronze in the autumn. They are divided to the petiole into seven to eleven narrow lobes which are again very finely cut and toothed, giving a fern-like appearance.

Acer palmatum dissectum is a very effective plant for the rock garden and for wild and water gardens. It must have a deep, rich and slightly moist soil, and makes the most satisfactory growth, when grown in dappled shade with shelter from cold winds.

PLANTS AND PROBLEMS—XXXII

TROUBLE WITH CELERY

Question. I have experienced difficulty with growing celery this past season as I found that a considerable quantity had run to seed. I usually sow the seed in mid February and plant out in mid May. I have used the same variety of celery over the past three years and this is the first time I have experienced difficulty. Was the trouble due to the wet summer of 1956 or can you suggest some other cause?

Answer. There have been a certain number of reports of failure with celery during 1956 and without doubt the peculiar weather did contribute to the difficulties of growing this crop. Failure can be associated with incorrect sowing date and/or some check to growth. At Wisley usually we sow our celery during the first week in March and plant out in late May. The bright and at times warm weather of April and May 1956, coupled with the early sowing you made, would mean that the plants you raised would be large when

in the boxes and so the boxes would be liable to dry out, thus the plants would receive a check. The cold wet weather of the summer would also not be very helpful in allowing the plants to overcome this check.

It was noticeable in the last trial held at Wisley that certain strains of seeds contained more bolters than other strains but the seed is unlikely to be responsible in your case as you have had satisfactory results in past years.

THE PEAR AND CHERRY SLUGWORM

Question. Last summer, my pear trees were attacked by small black, slug-like creatures which spoiled the leaves, making them turn brown. Can you tell me what they were and how to prevent such damage this year?

Answer. From your description we think the pest must be the Pear and Cherry Slugworm, *Caliroa limacina* Ritz. The adult sawflies are small, black insects which lay their eggs on the underside of the leaves. When the slugworms hatch (about mid June) they feed on the upper surface until they are ready to drop to the ground and pupate in the soil. There are normally two generations a year and the winter is spent in the pupal stage in the soil.

DDT, diluted according to maker's instructions, should be applied as soon as the slugworms are observed.

WISLEY TRIALS 1956

CANTERBURY BELLS

Twelve stocks of Canterbury bells (*Campanula medium*) were received for trial at Wisley. The trial was sown in the open ground on June 10, 1955, and planted out on August 10, 1955. The trial stood the winter very well; the majority of plants surviving and blooming very freely in June.

The trial was inspected by a sub-committee of the Floral Committee A on June 28, 1956, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to Canterbury bells.

The number in brackets after the description of the variety was that under which it was grown in the trial.

Cup and Saucer

CALYCANTHEMA BLUE. (Sent by Messrs. N. V. Sluis en Groot, Enkhuizen, Holland.) **H.C.** June 28, 1956. Plant 2¾ feet high, well branched; corolla 2½ inches diameter at mouth, 1¾ inches deep, saucer 3¾ inches diameter, Amethyst Violet (H.C.C. 35). [10]

CALYCANTHEMA ROSE. (Sent by Messrs. N. V. Sluis en Groot.) **H.C.** June 28, 1956. Plant 2½ feet high, well branched; corolla 1¾ inches diameter at mouth, 2$\frac{1}{10}$ inches deep, saucer 2½ inches diameter, Magenta (H.C.C. between 27/3 and 27/2). [5]

CALYCANTHEMA WHITE. (Sent by Messrs. N. V. Sluis en Groot.) **H.C.** June 28, 1956. Plant 3 feet high, well branched; corolla 2 inches diameter at mouth, 2 inches deep, saucer 2¾ inches diameter, white, when young creamy-white on the outer surface. [1]

Double

DWARF BEDDING MIXED. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 26/29 Drury Lane, Covent Garden, London, W.C.2.) **A.M.** June 28, 1956. Plant 1½ feet high, of very compact bushy habit; flowers 1⅝ inches diameter, 1 9/10 inches deep, colours included white, pale pink, rose, pale mauve and violet. [12]

GODETIAS

Fifty-one stocks of godetias were received at Wisley for trial during 1956. The trial was sown, in rows 18 inches apart in the open ground, on April 5, 1956, and the resulting seedlings were thinned considerably. The plants grew vigorously due to the moist summer and most of the varieties were between 9 and 18 inches taller than might be expected in a more normal season.

The trial was inspected by a sub-committee of the Floral Committee A on July 30 and August 8, 1956, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to godetias.

The number in brackets after the description of the variety was that under which it was grown in the trial.

Single flowered

Dwarf habit

SALMON PRINCESS. (Raised, introduced and sent by Messrs. Hurst & Son Ltd., 60/64 Artillery Lane, London, E. 1.) **A.M.** July 30, 1956. Plant 18 inches high, 18 inches spread, erect bushy habit; flowers 2 inches diameter; petals 1⅜ inches long, 1 9/10 inches wide, white at extreme base changing to a very clear shade of Porcelain Rose (H.C.C. between 620/1 and 620) over the major part of the petal. [3]

SUNSET. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 26/29 Drury Lane, Covent Garden, London, W.C. 2.) **A.M.** July 30, 1956. Plant 20 inches high, 18 inches spread, erect bushy habit; flowers 2½ inches diameter; petals 1½ inches long, 1⅜ inches wide, white at extreme base changing to Magenta (H.C.C. 27) over the major part of the petals, but fading at edges to Magenta (H.C.C. 27/2). [5]

Semi-dwarf habit

PURITY. (Raised, introduced and sent by Messrs. Hurst & Son Ltd.) **A.M.** July 30, 1956. Plant 24 inches high, 18 inches spread, erect bushy habit; flowers 2 7/10 inches diameter; petals 1⅜ inches long, 1⅜ inches wide, white, stamens creamy-white. [19]

VIVID. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **A.M.** August 8, 1956. Plant 24 inches high, 18 inches spread, erect bushy habit; flowers 2¼ inches diameter; petals 1⅜ inches long, 1⅜ inches wide, white at the extreme base changing to a bright shade of red near Rose Bengal (H.C.C. 25) over the major part of the petal. [18]

CHARMING. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **H.C.** August 8, 1956. Plant 30 inches high, 18 inches spread,

erect bushy habit; flowers 2¼ inches diameter; petals 1 7/10 inches long, 1 9/10 inches wide, white at extreme base changing to Magenta (H.C.C. 27) over the major part of the petal but fades at edges to Magenta (H.C.C. 27/1). [23]

KELVEDON GLORY. (Raised, introduced and sent by Messrs. J. E. Ohlsens Enke, Linnesgade 14, Copenhagen, Denmark.) **H.C.** August 8, 1956. Plant 24 inches high, 18 inches spread, erect bushy habit; flowers 2½ inches diameter; petals 1¼ inches long, 1⅜ inches wide, white at base changing to Carmine Rose (H.C.C. between 621/1 and 621) over the major part of the petal. [12]

Double flowered

Semi-dwarf habit

DOUBLE SYBIL SHERWOOD. (Raised, introduced and sent by Messrs. Hurst & Son Ltd.) **H.C.** July 30, 1956. Plant 24 inches high, 18 inches spread, erect bushy habit; flowers 2½ inches diameter; petals 1½ inches long, 1⅝ inches wide, white at base changing to a clear shade of pink near Carmine Rose (H.C.C. between 621/1 and 621) and fading slightly at edges. [33]

Tall habit

GRANDIFLORA FLORE-PLENO ROSEA. (Raised, introduced and sent by Messrs. J. E. Ohlsens Enke.) **A.M.** August 8, 1956. Plant 47 inches tall, erect habit; flowers 2 1/10 inches diameter; petals ⅝ inches long, 1⅛ inches wide, Fuchsine Pink (H.C.C. 627/2), small blotch at extreme base of petal of China Rose (H.C.C. 024/1). [44]

CHERRY RED. (Sent by Messrs. Watkins & Simpson Ltd.) **H.C.** August 8, 1956. Plant 36 inches high, erect habit; flowers 2 1/10 inches diameter; petals 1 inch long, 1⅛ inches wide, Magenta (H.C.C. 27) fading at edges to Magenta (H.C.C. 27/3). [47]

Azalea flowered

Semi-dwarf habit

DAWN. (Raised, introduced and sent by Messrs. C. Sharpe & Co. Ltd., Sleaford, Lincs.) **H.C.** July 30, 1956. Plant 24 inches high, 18 inches spread, erect bushy habit; flowers 2½ inches diameter; petals 1⅝ inches long, 2 1/10 inches wide, white at base changing to Porcelain Rose (H.C.C. 620/2) over the major part of the petal and fading slightly at edges. [27]

REMBRANDT. (Sent by Messrs. E. Benary, Hann-Münden, Germany.) **H.C.** August 8, 1956. Plant 29 inches high, 24 inches spread, erect bushy habit; flowers 2½ inches diameter; petals 1⅛ inches long, 1⅜ inches wide, Tyrian Purple (H.C.C. 727) with blotch in centre of petal of Fuchsine Pink (H.C.C. 627/3). [31]

LOBELIAS

Thirty-eight stocks of lobelias were received for trial at Wisley during 1956. The trial was sown on April 4, 1956, and the resulting seedlings were pricked out in boxes on May 3. The trial was planted out on June 18. The plants grew freely but due to the wet weather the flowers were rather transient.

The trial was inspected by a sub-committee of the Floral Committee A on July 30, August 8 and 16, 1956, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to lobelias.

The number in brackets after the description of the variety was that under which it was grown in the trial.

BLUE GOWN. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 26–29 Drury Lane, Covent Garden, London, W.C.2.) **H.C.** August 8, 1956. Plant 6 inches high, 9 inches spread, erect bushy and compact habit; flowers $\frac{7}{10}$ inch across, $\frac{7}{10}$ inch long, single, freely produced, Cornflower Blue (H.C.C. 742/1). [16]

COMPACTA WHITE LADY. (Raised, introduced and sent by Messrs. L. Clause, S.A., Bretigny-sur-Orge, France.) **H.C.** August 8, 1956. Plant 6 inches high, 10 inches spread, erect and compact habit; flowers $\frac{3}{5}$ inch across, $\frac{7}{10}$ inch long, single, freely produced, white. [1]

CRYSTAL PALACE. (Raised, introduced and sent by Messrs. J. E. Ohlsens Enke, Linnesgade 14, Copenhagen, Denmark.) **H.C.** August 8, 1956. Plant 6 inches high, 8 inches spread, erect and compact habit; flowers $\frac{3}{5}$ inch across, $\frac{3}{5}$ inch long, single, near Moorish Blue (H.C.C. 739). [32]

EMPEROR WILLIAM. (Sent by Messrs. E. Benary, Hann-Münden, Germany.) **H.C.** August 8, 1956. Plant 6 inches high, 9 inches spread, erect and bushy habit; flowers $\frac{7}{10}$ inch across, $\frac{7}{10}$ inch long, single, Cornflower Blue (H.C.C. 742/1). [14]

PUMILA SPLENDENS. (Sent by Messrs. Erfurter Samenzucht, Niederwalluf/Rhg., Germany.) **H.C.** August 8, 1956. Plant 6 inches high, 8 inches spread, erect, bushy and compact habit; flowers $\frac{1}{2}$ inch across, $\frac{3}{5}$ inch long, single, Cornflower Blue (H.C.C. 742/1), eye white. [25]

SALVIA SPLENDENS

Twenty-eight stocks of *Salvia splendens* were received for trial at Wisley during 1956. The trial was sown under glass on April 4, 1956, and the resulting seedlings were potted off singly into 3-inch pots on April 19. The trial was planted, 18 inches between each plant, in the open ground on May 31. The plants made good growth and flowered freely throughout August, September and early October.

The trial was inspected by a sub-committee of the Floral Committee A on July 30, August 8, 16, 22 and 29, 1956, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to *Salvia splendens*.

The number in brackets after the description of the variety was that under which it was grown in the trial.

BLAZE OF FIRE. (Raised, introduced and sent by Messrs. L. Daehnfeldt Ltd., 75 Vestergade, Odense, Denmark.) **A.M.** July 30, 1956. Plant 14 inches high, 15 inches spread, erect bushy habit, very free flowering; inflorescence 8 inches long, $2\frac{1}{4}$ inches across, compact; flower $\frac{3}{5}$ inch across, $\frac{9}{10}$ inch long, a vivid red near Dutch Vermilion (H.C.C. 717/1); the earliest stock in the trial. [13]

BLAZE OF FIRE. (Raised, introduced and sent by Messrs. L. Clause, S.A., Bretigny-sur-Orge, France.) **H.C.** August 22, 1956. Plant 14 inches high, 15 inches spread, erect bushy habit, free flowering; inflorescence $6\frac{3}{4}$ inches long, 2 inches across, compact; flower $\frac{3}{5}$ inch across, $\frac{9}{10}$ inch long, a vivid red near Dutch Vermilion (H.C.C. 717/1). [17]

BLAZE OF FIRE. (Sent by Messrs. J. R. Pearson & Sons Ltd., Lowdham, Nottinghamshire.) **H.C.** August 16, 1956. Plant 12 inches high,

12 inches spread, erect bushy habit, free flowering; inflorescence 6½ inches long, 2 inches across, compact; flower ½ inch across, ⅝ inch long, a vivid red near Dutch Vermilion (H.C.C. 717/1). [21]

FLAMBOYANTE. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **H.C.** August 29, 1956. Plant 24 inches high, spread up to 15 inches but would go further if planted wider apart, erect bushy habit, free flowering; inflorescence 9 inches long, 2½ inches across, fairly compact; flower ½ inch across, 1 inch long, a vivid red near Dutch Vermilion (H.C.C. 717/1). [26]

SAINT JOHN'S FIRE. (Raised and introduced by Messrs. E. Benary, Hann-Münden, Germany, and sent by Messrs. D. T. Brown & Co. Ltd., Poulton-le-Fylde, Lancashire.) **H.C.** August 22, 1956. Plant 13 inches high, 15 inches spread, erect bushy habit, free flowering; inflorescence 4½ inches long, 2¼ inches across, compact; flower ⅝ inch across, $\frac{9}{10}$ inch long, a vivid red near Dutch Vermilion (H.C.C. 717/1). [8]

SAINT JOHN'S FIRE. (Raised, introduced and sent by Messrs. L. Clause, S.A.) **H.C.** August 22, 1956. Plant 12 inches high, 12 inches spread, erect bushy habit, free flowering; inflorescence 6½ inches long, 2 inches diameter, compact; flower ⅝ inch across, $\frac{9}{10}$ inch long, a vivid red near Dutch Vermilion (H.C.C. 717/1). [9]

SCARLET PICCOLO. (Raised, introduced and sent by Messrs. A. Hansen, Kastrup, Amager, Denmark.) **H.C.** August 16, 1956. Plant 14½ inches high, 14 inches spread, erect bushy habit, free flowering; inflorescence 4 inches long, $2\frac{3}{10}$ inches across, compact; flower ⅝ inch across, 1 inch long, Vermilion (H.C.C. 18). [4]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1956

Anthyllis montana var. rubra A.M. May 22, 1956. A well-known variety of this hardy vetch from the mountains of Southern Europe, and of rather better colour than the type. In the plant exhibited there were about 150 flower heads, the standard of each flower being Fuchsine Pink (H.C.C. 627) with darker lines. The pinnate leaves are softly villose, and are borne on prostrate, much-branched stems. The plant is very suitable for pans in the alpine house and for the rock garden. Exhibited by the Director, Royal Botanic Gardens, Kew.

Campanula ephesia A.M. July 3, 1956. For several years before flowering this monocarpic plant develops large, velvety, lyrate leaves with an attractive appearance. In due course the flower stems develop and these are about 15 inches tall, covered with long, soft hairs and each bears five to eight large, axillary flowers. These are 2½ inches long and 1¾ inches across and coloured a most pleasing shade of Wistaria Blue (H.C.C. 640/2).

The plants shown from Wisley were raised from seed collected by Dr. P. H. Davis in 1950 at Priene and Ephesus, which he found on plants growing among rocks in full sun. Exhibited by Messrs. W. E. Th. Ingwersen Ltd., Gravetye, East Grinstead, Sussex, and the Director, R.H.S. Gardens, Wisley, Ripley, Surrey (Fig. 43).

Crocus biflorus var. weldenii A.M. February 28, 1956. This is the Dalmatian form of *C. biflorus*, occurring also in Serbia and Bulgaria, and is greatly superior to the type. The throat of the flower is invariably pure white, while the back of the outer segments may vary from white to deep purple. In the specimen shown the colour was Campanula Violet (H.C.C. 37/3), the anthers being a deep orange. There were just over fifty flowers in the pan, these being about 4 inches high. This crocus is said to persist from year to year in pots and pans, without renewal—this is not the case with many crocuses. Exhibited by Messrs. Hillier and Sons, West Hill Nurseries, Winchester (Fig. 40).

Cyclamen coum A.M. March 13, 1956. This well-known, hardy cyclamen occurs over a wide area in the Eastern Mediterranean region. The leaves, set on short stalks, are rounded rather than kidney-shaped, and are dark green above, without marbling, and of a purplish-red beneath. In the pan exhibited there were about ninety open flowers, the colour of these being Mallow Purple (H.C.C. 630). In this species the flowers are nearly as wide as they are long, giving a characteristic dumpy appearance when compared with some other species. Though quite hardy it benefits from a little protection during the winter months. Exhibited by the Director, Royal Botanic Gardens, Kew.

Cyclamen pseudibericum A.M. March 13, 1956. This fine cyclamen was first described in 1901 by Hildebrand, from plants growing in the nurseries of Messrs. C. G. Van Tubergen Ltd. of Haarlem. The leaves, like those of *C. orbiculatum*, are marbled above, but differ in having a crenulate margin. They are purplish red and glossy beneath. The flowers, of which there were about forty open in the pan submitted, are borne well above the leaves, and in this case were Phlox Purple (H.C.C. 632/1) in colour. They are larger than those of *C. coum* and *C. orbiculatum*, though the plant is quite as hardy as either of these. Exhibited by The Joint Garden Committee, Myddelton House Gardens, Middx. (Fig. 41).

Erica carnea 'Eileen Porter' A.M. October 29, 1956. This is a slow-growing form of *E. carnea*, remarkable for its earliness (late October or early November) and for its depth of colour. The plant shown was about 4 inches high and equally broad, and was said to be four years old from a cutting. The foliage was very dark green. There were about twenty-five heads of flowers, the colour of the flowers being Magenta Rose (H.C.C. 027/1) and of the calyx canary yellow. Exhibited by Messrs. Kibble and Clare Ltd., Ascot Wood Nursery, Ascot, Berks.

Inula heterolepis A.M. August 28, 1956. The white-felted ovate leaves, petioles and flowering stems of this plant, introduced from Anatolia in 1949 by Dr. Peter Davis, make it a desirable addition to the alpine house. It is attractive all the year round and the Chrome Yellow (H.C.C. 605) flowers, which have no ray florets, last for a long time. Exhibited by Mrs. D. E. Saunders, Husseys, Green St. Green, Farnborough, Kent.

Lilium oxypetalum insigne A.M. June 13, 1956. The type was formerly thought to be a nomocharis, and is frequently referred to under

that name. This variety was introduced from the Himalayas by Mr. Frank Smythe in 1938. In the pan exhibited there were six flowering stems, varying from 7 inches to 11 inches in height. The perianth lobes of the solitary flowers were greenish-yellow in colour. Exhibited by Mr. and Mrs. J. T. Renton, Branklyn, Perth.

Muscari latifolium A.M. April 17, 1956. A large pan of this bulbous plant contained many erect stems up to 12 inches high, each bearing an inflorescence some 2 inches long. The rather loose inflorescence is composed of two types of flower; one is fertile, urn-shaped and Plum Purple (H.C.C. 934) in colour, the other is sterile, narrow, tubular and Gentian Blue (H.C.C. 42/1) in colour. The leaves, up to 6 inches long and 1 inch wide, are pale green and flat.

Pleione pricei F.C.C. April 17, 1956. This Formosan orchid, eminently suitable for the alpine house, received an Award of Merit in 1920. The specimen exhibited bore thirty-one open flowers, Phlox Purple (H.C.C. 632/1 to 632/2) in colour, the fimbriate labellum being white, with yellow keels. Exhibited by R. B. Cooke, Esq., Kilbryde, Corbridge, Northumberland.

Primula bilekii A.M. April 17, 1956. This natural hybrid between *P. rubra* (syn. *P. hirsuta*) and *P. minima* makes a compact low-growing plant of which the specimen exhibited was 5 inches across and 1½ inches high. The bright green leaves were up to ¾ inch long and ⅛ inch wide, and were oblong and notched. The plant had twenty-four flowers each about 1 inch across, and of colour near Cyclamen Purple (H.C.C. 30/1) with a white eye. Exhibited by K. R. Wooster, Esq., Coniston, 10 Broxbourne Road, Orpington, Kent.

Primula chumbiensis A.M. June 13, 1956. The pendent flowers of this primula of the section Sikkimensis, from Bhutan, are borne in umbels on a scape from 6 to 12 inches high. They are pale Primrose Yellow (H.C.C. 601/3) in colour, with no eye. The leaves are oblong to elliptic in shape, with crenate-serrate margins, the petioles and midribs being red. It is said to be quite hardy in cultivation. Exhibited by Major G. Sherriff, O.B.E., V.M.H., Ascreavie, Kirriemuir, Angus.

Primula kellereri A.M. March 27, 1956. A very rare plant of the Brenner Alps, this delightful and easily cultivated primula is a natural hybrid between *P. minima* and *P. rubra*. Other popular hybrids of the same parentage are *P. forsteri* and *P. bilekii*, all three being grouped together botanically under the name *P. steinii*. The rosettes of ovate-cuneate, toothed, glabrous leaves form a tight cluster, the flowers rising just above it. In the specimen shown there were eight flowering stems, each bearing from four to six flowers, the colour being Phlox Purple (H.C.C. 632) with a white eye. Exhibited by Roy Elliott, Esq., 15 West Drive, Handsworth, Birmingham.

Primula reidii var. williamsii A.M. May 1, 1956. Introduced from Nepal in 1952 and 1954, this Soldanelloid primula was described in R.H.S. JOURNAL, **80**, 428–9 (Sept. 1955). In the specimen shown there were fifteen flowering stems, about 5 inches high, each bearing from

two to five scented flowers, white in colour but shading to Hyacinth Blue (H.C.C. 40/3 to 40/2) at the edge of the corolla. Exhibited by the Regius Keeper, Royal Botanic Garden, Edinburgh.

Salix myrsinites jacquinii A.M. March 27, 1956. This is the Tyrolean form of a mountain willow which is fairly widespread in the Northern Hemisphere, including the British Isles. It is a small shrub, the specimen exhibited being about 6 inches across and 4 inches high. The tiny, oval, pointed leaves and erect rusty-brown catkins make it an attractive plant. Exhibited by D. Drury, Esq., 25 Millington Road, Cambridge.

ORCHID

Cypripedium (Anna Marie g.) 'Urgency' A.M. November 27, 1956. The parents of this cultivar are C. (W. N. Evans g.) 'Rose Queen' and C. 'Harrow'. The plant exhibited bore a flower 4½ inches across by 4 inches deep. The large flat dorsal is mainly purplish-maroon and this fades towards the broad white margin. The base is flecked with green and dark purple spots. The lateral tepals slope slightly downwards and have the same basic colour, but here it is superimposed upon yellowish-green. A dark central streak traverses these tepals. The glossy labellum is similarly coloured to the lateral tepals and like them has a greenish-yellow margin. Exhibited by Messrs. Black & Flory Ltd., Slough, Bucks.

BOOK NOTES

British Plants

"The Englishman's Flora." By Geoffrey Grigson. 478 pp. Illus. (Phoenix House Ltd., London.) £4 15*s*.

"A Book of Wild Flowers." By Elsa Felsko and Sheila Littleboy. 231 pp. Illus. (Bruno Cassirer, Oxford.) 35*s*.

"Drawings of British Plants." By Stella Ross-Craig. Parts viii and ix; Rosaceae (1) and (2). (Bell and Sons Ltd., London.) 8*s*. 6*d*. each.

There are many indications at the present time that the study of British wild flowers has never been more flourishing. One such sign is the great support from amateur botanists that has been given to the scheme for recording, on maps, the distribution of the British flora, which is being organized at Cambridge by the Botanical Society of the British Isles; another is the large number of books that continue to be produced dealing with various aspects of our wild flowers. The present review notices a small selection of these that have recently appeared.

The Englishman's Flora, by Geoffrey Grigson, is a beautifully produced volume treating British plants from an unusual angle. It is not a "Flora" in the ordinary sense of the word, but rather, as Mr. Grigson says, an attempt to tell us the "human dossier" of our wild flowers, "what they have meant . . . to the Englishman in his daily life, in his ceremonies of spring, summer, and winter", and in "his feeding of body and of mind". Mr. Grigson has great learning and a lively style. He has ransacked the available literature, especially for "common names", of which he gives a most valuable index. The illustrations are taken from the works of Fuchs, Brunfels and other early herbalists. This is altogether a most delightful book and it is to be hoped that many British botanists will feel able to afford its rather stiff price; they will not regret their purchase.

A Book of Wild Flowers, containing 160 plates after watercolours by Elsa Felsko, is another unusual volume. The plates, which include several non-British species, are superb, but the selection of the plants illustrated and the purpose of the admirable but brief accompanying notes by Miss Sheila Littleboy is rather puzzling. The information given about each plant in these notes can easily be obtained more fully elsewhere and one feels that the space would have been more usefully employed in providing further illustrations. Professor Darlington's Preface is as stimulating as one would expect, but bears very little relation to the book, and the claim on the dust-wrapper that the volume forms "an absolutely reliable reference book for schools and universities, for the serious study of botany" can hardly be sustained. Rather, it is a charming picture-book that seems to have taken the wrong turning.

The "blurb" just quoted would be much more applicable to the two latest parts, covering the *Rosaceae*, of Miss Stella Ross-Craig's *Drawings of British Plants*. This series is by now well known to everyone interested in the British Flora, and one can only hope that time will permit the artist to complete her task in the not too remote future. We shall then have as fine a pictorial record of our flora as any country in the world.

J. S. L. GILMOUR

"Vegetables for Garden and Exhibition." By S. M. Gault. Large 8vo. 268 pp. Illus. (Collingridge.) 50*s*.

This is a subject upon which an up-to-date publication has been long desired; it is pleasing that this has been undertaken by one with such a high reputation and knowledge in the growing and exhibiting of vegetables. When a practical gardener such as Mr. Gault writes on a subject which has been his life's work, the reader obtains a feeling of reliability with the knowledge that the author is writing from his vast personal experience on the subject.

The book is most constructive and comprehensive and is attractively illustrated with some 126 photographs and illustrations. Some of the photographs, especially the frontispiece, give one the idea of the high standard that can be achieved in growing vegetables for show and for the table; while others, with the help of line drawings, illustrate useful tips and also some of the troubles that are encountered in the vegetable garden.

The author has divided the book into ten chapters each of which covers its subject in a most descriptive and yet simple manner. He begins with the selection of tools and continues through the gardener's cycle of events with the most important information on the management of the soil, fertilizers and manures, rotation cropping, inter-cropping, catch cropping, weed control and exhibiting. Chapter 9 consists of a calendar of work month by month in the kitchen garden which will be most helpful to the young gardener and the amateur alike.

Mr. Gault has taken up two-thirds of this large publication with a gardener's ideal ready reference book of considerable detail under the title of "The Vegetables". This section contains excellent advice on cultivation and exhibiting and on the control of diseases and pests. The author has also included the best varieties of each kind of vegetable to grow.

The book is concluded with two appendices, one being a clear and most comprehensive table on sowing, planting and cropping; the other giving guidance as to the requirements of and pointing system used at exhibitions as well as other information necessary to exhibitors and judges alike.

The publication is a most valuable contribution and will undoubtedly be of great interest and help to all those engaged in the exhibiting and cultivation of vegetables.

S. L. LORD

"See How to Garden." By C. E. Pearson, N.D.A. Illus. (Ward Lock.) 21*s*.

This small book certainly lives up to its title, *See How to Garden*. The eighty gardening operations which are illustrated are in most cases admirably clear demonstrations of how the work should be carried out. One of the exceptions shows a rhododendron being planted in a pocket of peat, enclosed in heavy stiff clay. The operation would have been more practically demonstrated if the surrounding natural soil had been mixed with peat while planting. Again, pictures illustrating the saddle grafting of rhododendrons show quite 6 inches or more of stock above ground, allowing for the everlasting nuisance of stock suckering.

The text accompanying the illustrations is, indeed, concise, and is reasonably accurate, yet it could be argued that the text is a little too brief. The author's statement that rhododendrons do best in a moist but well-drained peaty soil which is deficient in lime is not ideally worded. A "lime-free soil" would have indicated the plants' requirements more correctly.

The double page illustrating "Alpine Plants" displays a particular liking for *Saxifragas*, three out of the eight alpines shown being members of this genus. Nomenclature arrangement is not in any way consistent, the page showing flowering shrubs has six illustrations given Latin names and the remaining two common names. Again, 42, "Rhododendrons", the photograph labelled *orbiculare williamsiana* is incorrect, the correct name is probably 'Temple Belle' (*R. orbiculare* × *williamsianum*).

It is to be regretted that these minor details spoil an otherwise excellent book, which should be of great help to the beginner or weekend gardener, anxious to see how the job is done rather than wade through pages of words.

The book is well bound, the photographs printed on excellent paper, so perhaps the price of 21*s.* is not excessive.

FRANCIS HANGER

"Carnations Today." By Stanley B. Whitehead. Illus. 180 pp. (John Gifford Ltd., London.) 16*s.*

This is a good book, well written and beautifully produced. Perhaps the best sign of the ever-growing interest taken in the modern races of dianthus by the general public is the ever-increasing number of books about them. The virtues of this race of plants has been acknowledged from the earliest days, but here we have an author who can and does appreciate their many points and also the modern improvements.

The illustrations of this book match those of any other book on the subject—they are a joy. The beautifully coloured photograph of twelve border carnations on the jacket is superb; you may consider the arrangement of them a little stiff and formal, but it is so with all smooth-edged flowers, that is why professional florists prefer those with frilled petals, but that does not make the border carnation less beautiful; indeed, they have a formal Victorian charm of their own.

The interesting history of the development of the various types of carnations and pinks is fascinating reading; indeed, until we look back we cannot fully appreciate the colossal strides forward the various races have made. Privately, I fully appreciate the great pains the author has taken in making all this matter readable and interesting —the efforts of all too many horticulturists make unattractive reading.

The chapters dealing with the culture of border carnations and pinks are as workmanlike as a carpenter's bench, and the variety of information upon soils is noticeable; indeed, it is difficult to criticize this book.

Chapter 7, which deals with sweet williams and the ever-enlarging groups of hybrids, is interesting; it is, of course, in the New World with its better climates that these are more fully appreciated and where they flower best.

The chapter on carnations under glass gives clear, concise and sound information of most modern devices and should help to emphasize the point that any amateur can make a paying hobby of selling cut flowers from his greenhouse throughout the twelve months of the year if he grows the commercial kinds as advised in the book.

Pests and diseases are dealt with in a short and concise chapter, and wisely so, because simple modern remedies have made their eradication so simple. Old-time gardeners tended to frighten the amateur grower away from growing greenhouse carnations by a mumbo-jumbo of complicated potions, but here the author gives clearly and concisely the alternative and simple remedies for all the troubles he lists.

If one wished to be critical I should say that in this ever-changing modern age it is not wise in my opinion to give columns of names of varieties, especially of florist's flowers, and it is especially unwise in this instance as this book will be of use to both amateur and professional growers long after many of the varieties listed have ceased to be grown.

MONTAGU C. ALLWOOD, V.M.H., F.L.S.

"Window-Box Gardening." By Henry Teuscher. 180 pp. Illus. (The Macmillan Company, New York.) 25*s.*

"New life into an old hobby", this is what Mr. Teuscher hopes his book will bring. It has been written after ten years of observation and experimentation in connection with a city sponsored window-box competition in Montreal, of which he has been

Chairman, and his position as Curator of the city Botanical Garden has given him an added opportunity of giving authoritative and comprehensive information on how to make the best use of a very restricted space. He appeals to the adventurous spirits to go from "well to better" by trying out schemes for prolonging the period over which a colourful display of flowers can be secured (this by inner containers which can be changed with the season); and by using his "self-watering" suggestions (this by substituting for soil, vermiculite, fed by wicks of glass wool introduced through the drainage holes from a tray of nutrient below). The book is plentifully supplied with excellent diagrams and photographs as well as exhaustive lists of plants suitable for every situation with suggestions for effective combinations.

Bearing in mind that the atmosphere of Canadian and English towns is somewhat different this is a book for the more ambitious box gardener who will find here endless interest and stimulus.

H. G. NUSSEY

"The Flowering Plants of the Sudan." By F. W. Andrews. 579 pp. Illus. (Sudan Government.) 21*s.*

Dr. Andrews is to be congratulated on the publication of the last of three volumes, in which he has described the flowering plants of the Sudan. There are simple descriptions of the plants, simple keys of the genera and, in some cases, of the species; and there are some helpful line drawings.

It would be easy to suggest ways in which the value of this work might have been enhanced: there might have been reference to the collectors' numbers of specimens; and the distinctive characteristics of each species might have been printed in italics. But those who live in a small comfortable country like Great Britain, where the flowering plants are well known through the work of generations of botanists, may not realize how great a physical and mental effort has been needed for this pioneer work.

Dr. Andrews seems justified in his hope "that this flora will form a sure foundation upon which a more detailed flora may one day be written".

A. S. THOMAS

"The Use of Lime in Agriculture." Bulletin No. 35, Min. of Agriculture, Fisheries and Food. 53 pp. Illus. (H.M.S.O.) 3*s.* 6*d.*

This is the fifth edition of a pamphlet first published in 1951 which has been "enlarged and entirely rewritten to take account of modern developments". A new section has been added dealing with horticultural practice. While primarily intended for the farmer and the larger market grower the amateur gardener will find useful the clear exposition of the general principles of pH and liming given in the earlier sections.

PATRICK M. SYNGE

"Watercress Cultivation." Bulletin No. 136, Min. of Agriculture, Fisheries and Food. 28 pp. Illus. (H.M.S.O.) 2*s.* 6*d.*

This is the second edition of a bulletin first published in 1947. New sections on raising crops from seed and on diseases of watercress have been added. It gives a clear account of the making of watercress beds and its cultivation, together with a useful calendar of operations and should be studied by anyone who is a grower of watercress or is planning to establish watercress beds. As a crop it is almost unique in that ten crops may be gathered from one bed in the year.

PATRICK M. SYNGE

The following books have been received:

"Report of the Committee on Marketing of Woodland Produce 1956." Forestry Commission. 100 pp. (H.M.S.O.)

"The Pine Shoot Moth and related species." Forestry Commission. (H.M.S.O.)

ORDERS FOR BOOKS

The Society does not sell any publications other than its own. Orders for books reviewed should therefore be sent direct to the booksellers and not to the offices of the Society.

The contents of this volume are copyright. For permission to reproduce any of the articles application should be made to the Council.

THE ALPINE GARDEN SOCIETY

Offers its members—for only £1 per annum:

Its renowned Quarterly Bulletins.

Seed Distribution of over 1,500 species.

Postal Library Service.

Tours and Excursions abroad.

Flower Shows in London and elsewhere.

Local Groups in various centres.

Residential Alpine Study Week-ends.

Visits to notable Rock Gardens.

Apply to:
C. B. SAUNDERS,
Husseys, Green Street Green,
Farnborough, Kent

BEST QUALITY NURSERY STOCK

from West Sussex

We offer for present delivery some of the most reliable trees and plants obtainable from our 100-acre nurseries, situated in the exposed fertile belt beneath the South Downs.

FRUIT TREES **ROSES**
FLOWERING TREES and SHRUBS
HEDGE PLANTS **CLIMBERS**
HERBACEOUS and ROCK PLANTS
in best varieties

Interesting 80-page catalogue with illustrations on request

BN Ltd

THE BARNHAM NURSERIES LTD.

BARNHAM, Nr. Bognor Regis
SUSSEX **(Established 1880)**

By Appointment
to Her Majesty the Queen
Seedsmen

SUTTON'S SEEDS

Whenever keen horticulturists gather together, there you will hear them speak of the outstanding results they've achieved with SUTTON'S SEEDS. You will also hear them praise the direct and *personal* service that Sutton's give their customers.

★

May we send you a free copy of Sutton's 1957 Garden Seed Catalogue?

SUTTON & SONS LTD.
Dept. R.H.S. 3
READING

WAKELEY'S
(Registered Trade Mark)

4lb HOP MANURE

Stable manure is scarce, but you'll find Wakeley's Four-Fold Hop Manure a perfect substitute—Humus, Nitrogen, Phosphates and Potash—everything the soil needs from seed-time to harvest—to enrich it, and stimulate and sustain plant life and growth.

PRICES :

Small Bag 8/6, Medium Bag 12/9, Large Bag 21 -, 10 Large Bags 205/-, 20 Large Bags 400/-

Prices subject to alteration without notice

FROM ALL THE BEST NURSERYMEN AND SEEDSMEN

or carriage paid England and Wales (Scotland 1/6 Large Bag; 1/- Medium Bag; 9d Small Bag extra). If any difficulty, write to address below.

Write for new season's price list. Booklet of cultural instructions also sent if required.

Our list of Gladioli, Dahlias and Plants is now ready. Free on application.

WAKELEY BROS. & CO Ltd.
235 Blackfriars Road, London, S.E.1

For Spring Gardening

The 'Supra' Trolley Kneeler. Reg. Design 873960
(1) Slot-in-tray for "Moler" trowel or hand-fork to assist gardener to rise.
(2) Rubber kneeling mat, 14" × 7" × ¾".
(3) Cast aluminium frame, overall height 4".
(4) Hardwood rollers.

Move from plant to plant without rising or stooping

Post paid 39/6 (U.K.). Overseas 3/6 extra.

700 'Moler' Hand Tool. Reg. Design 876159
A unique new aid for **Weeding, Lifting Bulbous Plants, Aeration, Raking**
Ladies' Pattern (5 tines): 8/6 post paid (U.K.)
Ladies' Long-Handle (20 in. o/a.): 11/6, post paid (U.K.)
Men's Pattern (6 tines): 9/6, post paid (U.K.)
Men's Long-Handle (23 in. o/a.): 12/6, post paid (U.K.)

Our illustrated list of Tools and Brushes free on request

COOKS (*Norwich*) BRUSHES LIMITED
Makers since 1814
DAVEY PLACE, NORWICH, NORFOLK

Now available:—

MURPHY SPRING SPRAY

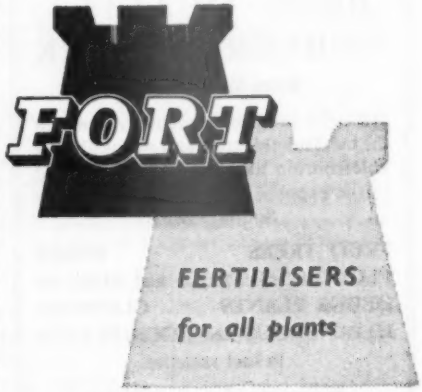
(Containing BHC and DDT)

The Easy, Efficient, Economical control for

- **APHIDS** *(Green & Black Fly)*
- **APPLE SUCKER**
- **CATERPILLARS**
- **CAPSID BUG**
- **APPLE BLOSSOM WEEVIL**
- **WOOLLY APHID**

Full details available on request.

THE MURPHY CHEMICAL CO. LTD.
WHEATHAMPSTEAD · HERTS



General: General plus Aldrin : Growmore.
Chrysanthemum : Tomato : Lawn Feed.
Lawn Fertiliser and Weed Killer : J.I. Base.
All "Straights" : "Nitro-Chalk" etc.

Manufactured by
Lindsey & Kesteven Chemical Manure Co. Ltd.,
Saxilby, Lincoln. Tel: Saxilby 397/8

Webb
Reg'd. TRADEMARK

FOR LOVELY LAWNS with LESS EFFORT

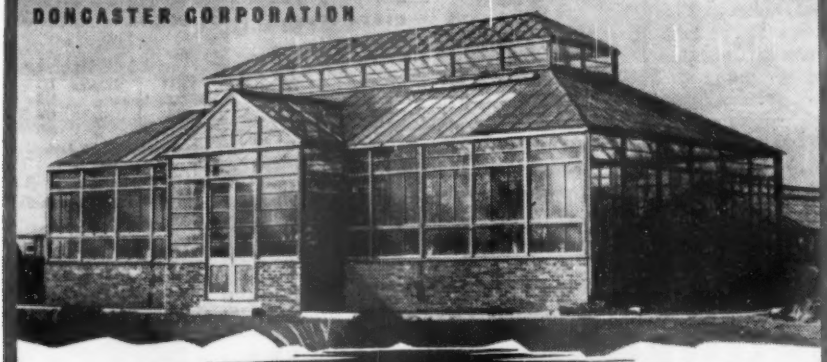
The reputation for sound design and craftsmanship associated with the name Webb is your guarantee of a lawn-mower that will give long service, sweet-running and maximum value for money

14" DE LUXE ELECTRIC MODEL
6 or 8 Bladed. Powered by ¼ h.p. Hoover motor. Selector gives immediate option of self propelled or cutting cylinder only drive. Double row ball bearings. Operates as efficiently and easily as a vacuum cleaner.

THE WEBB RANGE offers a choice of models to suit every preference and pocket with: The WHIPPET 10", WASP 12", WITCH 12", and 2-speed DE LUXE Hand Mowers and the 12" and 14" STANDARD SELF PROPELLED ELECTRIC MODELS and 14" DE LUXE GEAR DRIVEN MODEL.

H. C. WEBB & CO. LTD. TAME RD. WITTON BIRMINGHAM 6

A conservatory recently built for
DONCASTER CORPORATION



W. RICHARDSON
AND Co LIMITED
Est. 1876
HORTICULTURAL AND HEATING ENGINEERS
Neasham Road, DARLINGTON · 117 Victoria Street, LONDON, S.W.1

'ECLIPSE' PEAT
is
SEDGE PEAT

Write for our special booklet on how to use the different grades we supply—particularly for heavy clay or sandy soil.

THE ECLIPSE PEAT CO., LTD.
ASHCOTT, Near Bridgwater, SOMERSET

"RIVIERA" SCREENING

is split ½" dia. bamboo bound nearly close by galv'd wires in 10-yd. rolls—49", 59" and 69" wide.

IDEAL FOR INEXPENSIVE GREENHOUSE BLINDS, ETC.

SIGHT PROOFING OPEN WIRE OR IRON FENCES, ETC

Fencing and Gates. All types supplied and fixed. Oak Pale Panels, Wovenwood, Hazel and Osier, Hurdles, Chestnut Fencing, Teak Garden Furniture

GERALD GILMER LTD.
TEL.: 1640/1 **LEWES** EST. 1922
And at BISHOP'S WALTHAM. Tel.: 271

THE TREE SPECIALIST Co., Ltd.

Head Office:
RUSTINGTON, SUSSEX
Telephone: **1679 (all lines)**

Depots:
Chichester, Dorking, Reigate, Lewes, etc.

NO CHARGE
ADVICE AND ESTIMATES

Every description of tree work by experts

HYDE SNOWDROPS

'Arnott's Seedling' (A.M. 1951)
'Colesbourne' (A.M. 1951)
'Magnet'
and
many other varieties

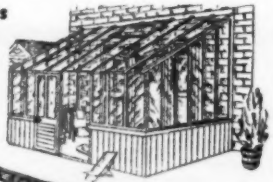
Planting time March - April, while in flower

Send 2d. stamp for Price Lists from

GIANT SNOWDROP CO.
HYDE, CHALFORD
GLOUCESTERSHIRE

Conservatories

Garden Dens . .



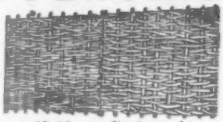
Garages, greenhouses, loose-boxes and garden buildings of all descriptions.

Please send for Illustrated catalogue

ALPHA WOODCRAFT LTD.,
Dept. 24, Star Road, Hillingdon Heath, Uxbridge, Middx. *Tel. HAYes 0657*

WATTLE FENCING

An Economical Dividing Fence
Close Woven
Excellent Windshield



IN 6 FEET LENGTHS				Stakes	
	3' high ...	12/11			
	4' " ...	17/2		"	1/3
	5' " ...	22/6		"	1/6
	6' " ...	27/11		"	1/9

Reduction dozen lots. Despatch 10–14 days.
Carriage Paid Stn. (200 miles)
ORDER NOW—*or send for free catalogue*

DAVIDS RURAL INDUSTRIES LTD
Dept. R, 15 Moreton St., London, S.W.1
(Late of Ebury St.)
Tel. : Tate Gallery 8332

FRUIT TREES

For the BEST—PLANT BUNYARD'S

The skill and experience gained over 160 years goes into the production of our famous Kentish Fruit Trees. Send today for a copy of our comprehensive Fruit Tree Catalogue and Planting Guide, listing all the best varieties at moderate prices.

GEO. BUNYARD & CO. LTD
(Dept. 28) MAIDSTONE, KENT

ALLWOOD'S CARNATION FLOWERS

direct from the largest growers, are the ideal gift for all occasions.

Selected colours or unique mixed shades.

From:
1 gn. to 5 gns. per box
Write for Catalogue

Allwood Bros LTD
Carnation Specialists

Cut Flower Dept.
HAYWARDS HEATH SUSSEX
Wivelsfield 232

a

REVOLUTION in HOES

The NEW SWOE

PRICE
40/-

The Wilkinson Sword SWOE represents the greatest advance in soil cultivation since the hoe. Its hollow-forged cutting blade, ground on three edges, enables you to create a fine tilth so essential for the maintenance of healthy plant life. In this way weeds are controlled at the germination stage. The SWOE enables you to work round plants without interfering with nature's own soil structure and the network of plant roots. This fine instrument, which is 58" long and has a canted handle, is specially designed for easy and comfortable handling—indeed, SWOEing is a pleasure, not a labour.

WILKINSON SWORD

WILKINSON SWORD LIMITED, LONDON, W.4

THE STORY OF STRAWSON GREENHOUSES

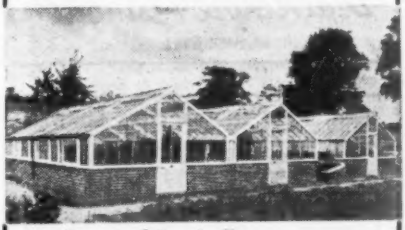
Surveys

A Strawson Greenhouse is designed and built to last a lifetime and to give perfect growing conditions all the year round. It pays to have a Survey of Inspection, which can be arranged in any part of the country at short notice. The siting, both for convenience and results, can play an important part in the ultimate plans, and the advice given at this stage is always beneficial and often even economical.

Planning

After the Survey, the plans are very carefully prepared in co-operation with horticultural and architectural advisers when necessary. Research, design and construction are wedded together to give that satisfaction for which we are renowned. The final plan caters in detail for every section of the Greenhouse, including special requirements, and when submitted with the estimate, the customer can appreciate the advantage of having approached the makers of the Finest Greenhouses in the country.

Next month we shall be writing about the wonderful materials used in making these Greenhouses.



"A Personal Service"

Enquiries should be addressed to Mr. R. F. Strawson, who will *personally* send estimates and full particulars of the famous Strawson range of Greenhouses, Frames, Greenhouse Heating, and other valuable information.

G. F. STRAWSON & SON, HORLEY, SURREY *Tel.:* Horley 130

LAWNS

Pedigree Seeds · Fertilisers of Guaranteed Analysis
Top Dressings
LIST ON REQUEST

Expert advisory and laboratory service free

VERDA (Lawns) LTD.
Abford House, Wilton Road, S.W.1

Do you like Asparagus?

Connover's Colossal
Best Evesham Crowns

	Per 100	Per doz.
1-year-old	45/-	8/-
2-year-old	55/-	9/-
3-year-old	65/-	10/6

Cultural instructions

Bags free; carriage paid for c.w.o.

Seed Catalogue containing all of the best "Vale of Evesham" Strains available upon request.

H. J. SPEED & SONS Ltd.
(Dept. A.1) Tel. 2611
Evesham, Worcestershire

HYDRANGEA
(HORTENSIS)
SPECIALISTS

Twenty-five of the most modern varieties in strong one-year pot grown plants.
We grow good *Roses* too!
Stamped addressed envelope for lists please.

W. C. WICKS LTD.
Mapperley Nurseries, Nottingham
Growers of good plants since 1880

MECONOPSIS BAILEYI
The Glorious Blue Poppy

Two-year-old plants, **40**/- per dozen
One-year-old plants, **27**/- per dozen

Three or six at dozen rate. Add 2/- in the £ for packing and postage. Send 2d. stamp for Catalogue of Primulas, Alpine and Herbaceous Plants.

H. G. & P. M. LYALL, Bricket Wood, Watford, Herts. Garston (Herts.) 2098

YOUNG SEEDLINGS

For those who lack the time or facilities for raising seed, we offer Young Seedlings of our following specialities:

Young seedling Double Begonias 12/6 dozen
Young seedling Delphiniums . . 10/- ,,
Young seedling Cyclamens . . . 12/6 ,,
Young seedling Polyanthus . . . 7/6 ,,

All are mixed colours and are sent post free.

Seedlings are also available of our glorious new polyanthus—**Langdon's Blue** and **Langdon's Pink.** Each colour 15/- per dozen, post free.

Blackmore & Langdon
of BATH

DEVONSHIRE VIOLETS *(all scented)*

Princess of Wales	(transplanted) ...	doz. 12/-
,, ,, ,,	Rooted Runners	100 40/-
Bournemouth Gem.	Fine purple (transplanted)	doz. 9/-
,, ,,	Rooted Runners	100 30/-
Czar.	Large blue (transplanted) ...	doz. 10/-
,,	Rooted Runners	100 35/-
Double Parma Violets	... ...	doz. 15 -
Lily of the Valley.	Giant flowering size	100 25/-
,, ,, ,,	Planting size ..	100 15/-
Primula Denticulata.	Flowering size	doz. 12/-
Blue Primroses ..	... ...	doz. 9/-
Sweet William, Indian carpet	...	100 15/-

All carriage paid for cash

ALFRED RENDLE, F.R.H.S., Violet Grower,
Shaugh Lodge, Paignton, S. Devon. Phone 57742

YOUR NEW HERBACEOUS BORDER

A free Planting Plan is dispatched with the plants
No. 1 for border 50 ft. × 10 ft. wide
No. 2 for border 50 ft. × 6 ft. wide

No. 1 contains 47 desirable varieties totalling 141 plants costing £11 5s. 0d. carriage paid.

No. 2 contains 34 desirable varieties totalling 102 plants costing £8 0s. 0d. carriage paid.

List (a) and plan upon request. Also Rose and Fruit (b) and Flowering Shrub List (c).

ARTHUR CHARLTON & SONS, LTD
Summervale Nurseries, Eridge Road, Tunbridge Wells

UNDER ROYAL PATRONAGE

"A Super Gardening Glove," delighted users tell us!

THORNPROOF GLOVES
HEDGING GLOVES
DIGGING GLOVES

Made with a super-quality processed pliable hide
Latest Price List Now Ready
All sizes and as supplied to Fellows of R.H.S. since 1920

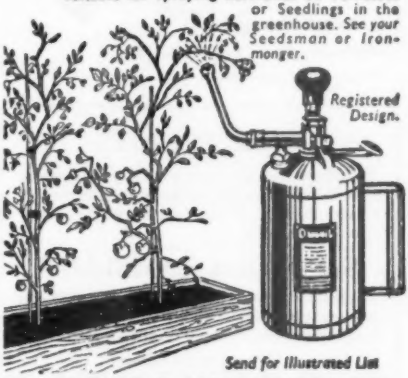
ADA EVERITT, Gardening Gloves
82b, CONSTABLE RD., IPSWICH, SUFFOLK

DRON-WAL *Supreme* SPRAYERS & SYRINGES

The "MASTER" PNEUMATIC SPRAYERS

For ALL your spraying needs!

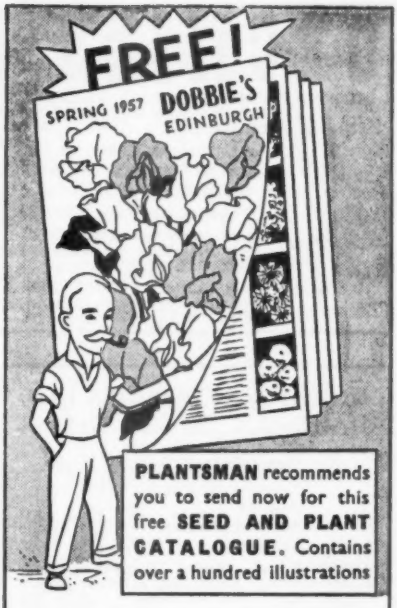
Simple, Easy Action, Brass throughout. Takes all insecticides, with bend for underleaf spraying. Highly suitable for spraying hormones on Tomatoes or Seedlings in the greenhouse. See your Seedsman or Ironmonger.



Send for Illustrated List

The PHILIP B. WALDRON CO.,
Kings Road, Tyseley, **BIRMINGHAM, 11.**

FREE!



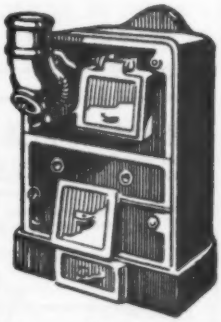
PLANTSMAN recommends you to send now for this free **SEED AND PLANT CATALOGUE.** Contains over a hundred illustrations

DOBBIE & CO. LTD.,
DEPT. R. **EDINBURGH 7.**

GREENHOUSE HEATING EQUIPMENT...

Phillips Boilers are confidently recommended for their exceptional value and economy in operation. Boilers or complete sets can be supplied. Thousands of satisfied users. Boilers are available in 5 sizes from £8 2. 0.
Send for complete list.

COMPLETE APPARATUS
Examples:—
Prices include boilers, smoke stack, etc. All h.w pipes, stays, expansion joints, bolts, etc., ready to fix. Easy to follow instructions sent with every apparatus. Prices are for a house with two 4" h.w. pipes on one side of the house.
6ft. × 6ft. £16 10. 0
8ft. × 6ft. £17 9. 9
10ft. × 8ft. £18 19. 6
Deferred terms available.



We would recommend that you send for our catalogue which gives complete details

H. E. PHILLIPS LTD
96 King William Street, Coventry

FLEXIBLE EARTH

OUR 68-PAGE BOOKLET AND SUPPLEMENT, ENTITLED

STAGGERING RESULTS

has 17 pages of cultural hints and 44 Funny Cartoons and a random selection of 107 Testimonials demonstrating the wide range of plants that benefit. This, together with a copy of

THE MAGIC OF CORNWALL

WILL BE SENT FREE TO ALL WHO SEND US A LARGE S.A.E.

FREE

CORNISH FLEXIBLE EARTH CO. LTD.
52 LANIVET, BODMIN, CORNWALL

"S.L.S." LAWN

ORCHIDS

BUY YOUR ORCHIDS AT A REASONABLE PRICE FROM THE ACTUAL PRODUCERS

CYMBIDIUMS, CYPRIPEDIUMS, CATTLEYAS, etc., ODONTOGLOSSUMS and CURIOSITIES

Flowering size plants from 20/-

Our Illustrated Booklet "The Simplicity of Orchid Growing" will be sent FREE ON REQUEST.

MANSELL & HATCHER, LTD.
Dept. R.H., Cragg Wood Nurseries,
RAWDON, LEEDS, Yorkshire.

CHRYSANTHEMUMS BEGONIAS and DAHLIAS

TRY WOOLMANS FIRST

50-page Chrysanthemum annual guide and catalogue (colour illustrated). 9d. please.

H. WOOLMAN LTD.,
SHIRLEY, Near BIRMINGHAM

KNIGHT'S NURSERIES LTD.
HAILSHAM Tel.: 454

For Aromatic and Culinary Herbs

Tarragon true French	1/9 each
Angelica	2/6 „
Lavender Munstead	2/6 „
Santolina	2/- „

Chives, Fennel, Hyssop, Peppermint, Sage, Common Thyme, Lemon Thyme, etc., at 1/3 each
Mint 6/- dozen

Carriage paid on orders for 10/- or over

Send for full list of Herbs and Herbaceous plants, etc.

TREE PEONIES

We now have the most extensive commercial collection in this country of these magnificent hardy shrubs. Easily grown, they are among the longest-lived of all shrubs.

SASANQUA CAMELLIAS

Loveliest of all winter-flowering shrubs, the single flowered kinds are sweetly scented. We have a good stock of the best varieties, from 1½ft. to 4ft. high.

Catalogue on request

THE SANDHURST NURSERIES
SANDHURST · CAMBERLEY · SURREY

THE MECHANIZED GARDEN CENTRE

Garden equipment, motor mowers, motor scythes, rotary cultivators, hedge trimmers, chain saws, flame guns, sprayers, lawn sweepers, etc.

Available ex-stock – demonstrations

BETTER GET IT AT

GODFREYS

110 Marylebone Lane, W.1 (WEL. 6842)
and Brenchley, Kent

HORTICULTURAL THERMOMETERS

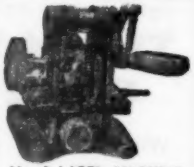
MAXIMUMS AND MINIMUMS,
STERILISERS, HOTBED,
WET AND DRY HYGROS., ROOM

Send for Descriptive Leaflet and Prices
Trade Enquiries Invited

W. BLACKMAN LTD.
227-9 GOSWELL ROAD, E.C.1

'SERPENT'

INDELIBLE (LEAD)
LABELS
LAST 100 YEARS
NEAT, LEGIBLE, SELF-AFFIXING ADAPTABLE, COMPLETELY RELIABLE



No. 1 LABEL MACHINE

Printed with any (different names, 4/3 dozen; 34 - 100. Label-printing Machines from £3 19s. 6d. Send for lists and FREE SAMPLE (any name). Complete Label-machine Outfits, from £5 5s. 0d., postage 3/-, make IDEAL GIFTS

SERPENT LABEL WORKS
ROCKBEER, EXETER

HAUCK FLAME-GUNS

are the first choice of every discriminating buyer. More Hauck Flame-Guns are in use than all other makes combined.

Send in your order now and get those jobs cleared up without delay.

Prompt deliveries.

Other models available.

VULCAN JUNIOR MODEL

Write for catalogue to Sole Distributors Phone
GEFARE LIMITED WISBECH 1577

"SISIS" LAWN TOOLS

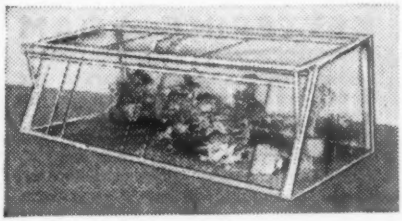
AER-DRAIN FORK

This six-purpose Turf Renovating Fork is available with interchangeable tines for solid tining, surface drainage, hollow tining and root pruning

Illustrated Brochure from:—

W. HARGREAVES & Co. Ltd.
"SISIS" Works, Cheadle, Cheshire

FOR EARLY CROPS INSIST ON A



Pluie Garden Frame

★ INSTANTANEOUS OPENING FOR RAIN, WITH SIDE PROTECTION ★ PERFECT VENTILATION
★ MAXIMUM LIGHT ★ NO BOLTS OR PUTTY

SEE US AT THE IDEAL HOME EXHIBITION

PLUIE SPAN Size 4 ft 9 in. long, 29 in. wide, 20 in. high at back. Price complete with ends .. .. **£6 - 16 - 0**
Extension without ends .. .. **£5 - 15 - 0**

PLUIE MAJOR Size 4 ft 9 in. long, 4 ft wide, 20 in. high centre. Price complete with ends .. .. **£9 - 16 - 0**
Extension without ends .. .. **£8 - 6 - 0**

Send for leaflets and a free cropping plan

POULTMURE LTD. (DEPT. H.S.)
5 COLLEGE ROAD, HARROW, MIDDLESEX

UNWINS OF HISTON

Seeds of Quality

Wise planning means the careful selection of the seeds you use. Now is the time to start planning for the finest garden display you've ever had.

Unwin's Seeds of Quality with their world-famed reputation for reliability will give you the utmost chance of success with your garden.

Send a post card now for the new, beautifully illustrated *free* catalogue, full of helpful culture hints and offering Unwin's wonderful range of Sweet Peas, Gladioli and a host of other superb flowers and vegetables.

Est. 1765

Rely on Benjamin R. Cant's Roses for consistently beautiful blooms. Catalogue in full colour on request. Send 3d. for postage.

BENJAMIN R. CANT
& SONS LIMITED

THE OLD ROSE GARDENS
COLCHESTER, ESSEX

THE PASSING SHOW

Watch out throughout the year for our unpretentious fortnightly exhibits of shrubs *in season*. If you require personal attention and prompt delivery, then deal with your *most* regular exhibitors:—

Burkwood & Skipwith Ltd.
The Shrub Specialists
Park Road Nurseries, Kingston, Surrey
Telephone: KIN 0296

TARRY'S KETTERING LOAM

Finest top spit taken from our own virgin fields. Quotations by return. for delivery in 7/8 ton lorry loads.

V. TARRY
PYTCHLEY LODGE, KETTERING
Telephone: KETTERING 4016

SMAIL'S GARDEN SHOP

Seeds for Garden or Indoor Culture
Climbing, Alpine and Hardy Plants
Flowering and Evergreen Shrubs
Fertilizers, Insecticides
Sankey's Garden Pots
John Innes
Composts

W. SMAIL
44/46 Palmer Street, Westminster, S.W.1
ABBey 4427
One minute from St. James's Park Station
Five minutes from R.H.S. Hall

"SHAMROCK" BRAND
IRISH MOSS PEAT

Finest quality only. Sterile, weed and pest free. Genuine Sphagnum Moss origin with an ideal granulation and highest moisture absorption rate.

Full details-leaflet and prices from

IRISH PEAT MOSS (SALES)
59 Park Street, Bristol, 1

BAMBOO CANES

All per	A. Thin	B. Med.	C. Stout	D. Ex Stout
100	s. d.	s. d.	s d.	s. d
12 in.	2 6	3 0	4 0	5 0
18 in.	3 0	4 0	5 0	6 0
2 ft.	4 0	6 0	7 6	10 0
2½ ft.	5 0	7 0	10 0	15 0
3 ft.	7 6	10 0	15 0	20 0
3½ ft.	10 0	12 6	20 0	25 0
4 ft.	12 6	15 0	25 0	30 0
5 ft.	25 0	30 0	35 0	40 0
6 ft.	30 0	35 0	40 0	45 0
7 ft.	40 0	45 0	50 0	60 0
8 ft	45 0	50 0	60 0	70 0
10 ft	50 0	60 0	70 0	80 0

Orders up to £1 add 2s. post. Carriage paid nearest station. C W O

THE BRITISH BAMBOO CANE CO. LTD.
52 LANIVET, BODMIN, CORNWALL

KETTERING LOAM

As supplied for over 30 years to the Leading Horticulturists. Hand-Dug Yellow Fibrous, from our own virgin fields. Also Bedfordshire Silver Sand and Noted Nottingham Marl.
Quotations for any quantity, delivered by Rail or Road Transport to your door.

KETTERING FUEL CO. LTD.
28a STATION RD., KETTERING, NORTHANTS
Telephone: 3059

VALE OF EVESHAM ASPARAGUS CROWNS

1 year, 6/- per dozen, 40/- per 100
2 „ 8/- „ „ 50/- „ 100
3 „ 10/- „ „ 60/- „ 100

March/April delivery. Carriage and packing free Cash with Order

Dahlia and Chrysanthemum Catalogues sent on request

L. STAITE
AVON NURSERIES, AVON STREET, EVESHAM • Tel.: Evesham 2406

Buy your
AFRICAN VIOLETS
FROM THE
SPECIALISTS

We have selected over 50 of the finest varieties available. Mostly recent American introductions, tried and tested on our Nurseries. Sure to please sorts. Seeds. Leaves. Small Plants. Flowering Plants. Available March-September.

Send stamped addressed envelope for list please.

W. C. WICKS LTD.
Mapperley Nurseries, Nottingham
Growers of good plants since 1880

The OBVIOUSLY successful gardener!

He's an 'Armchair Gardener' — winning superb results with minimum effort. His plants are vigorous, disease resistant, colourful and fruitful because they revel in an abundance of *Natural* Nourishment. It's simple—he feeds them as he waters with BIO Plant Food, the scientifically balanced concentrate from natural humus which *Feeds Plants Naturally*.

Feed through-the-season with BIO Plant Food—you'll soon see the difference.

Prices from 2/- 8-oz. bottle

* *Products which give the pleasure of SUCCESS with armchair ease.*

N.B. When planting out and sowing, use BIO Humus. BIO Humus creates moisture-retaining, well aerated conditions to encourage root development — *ideal* for feeding on with Bio Plant Food. Put a handful under each plant when planting out.

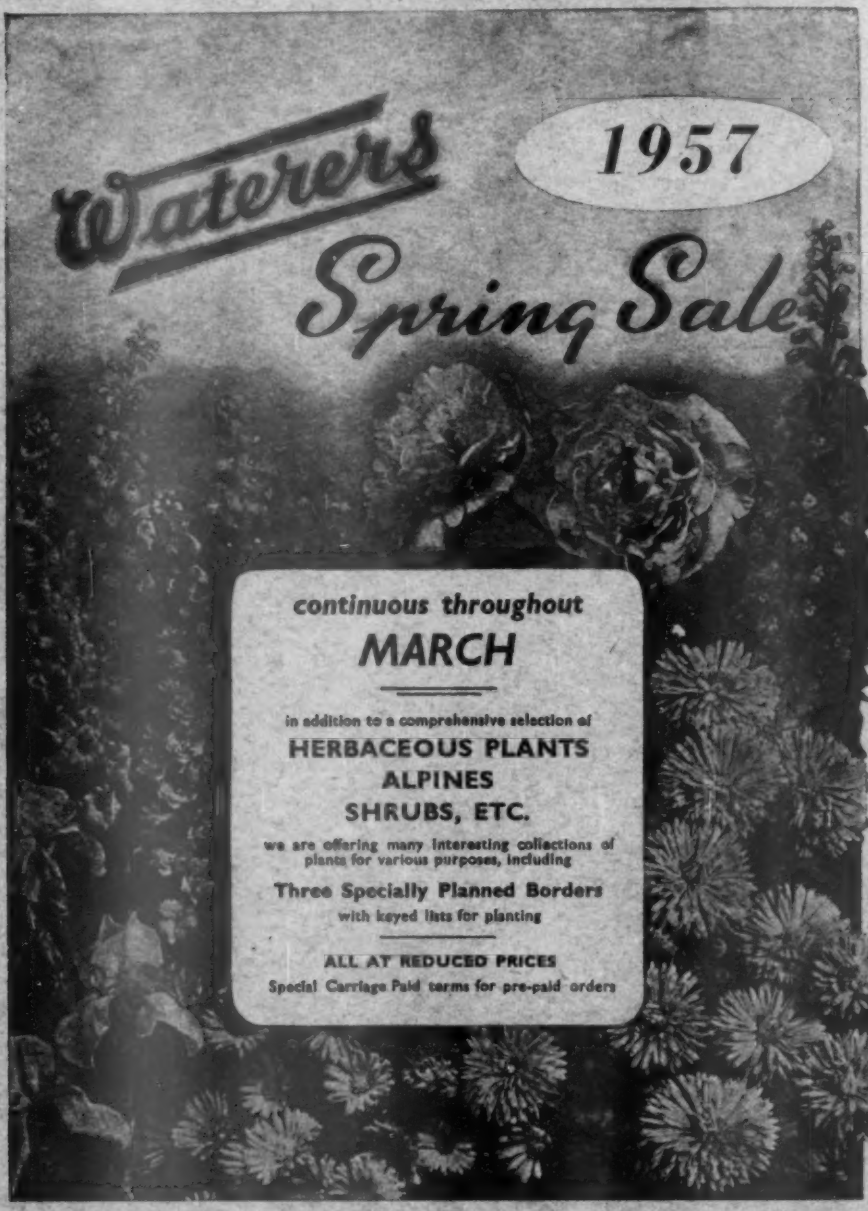
FROM YOUR LOCAL GARDEN SHOP

Bio PLANT FOOD

feeds plants NATURALLY

PAN BRITANNICA INDUSTRIES LTD., WALTHAM ABBEY, ESSEX

One of the Tennant Group of Companies



Write now for Special Spring Sale Catalogue
—— post free on request ——

JOHN WATERER, SONS & CRISP, LTD
THE FLORAL MILE, TWYFORD, BERKS
TELEPHONE WARGRAVE 224 (3 lines)

Shrub Nurseries: BAGSHOT, SURREY · Bagshot 2288/2289

Printed by Spottiswoode, Ballantyne & Co. Ltd., London and Colchester